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पत्रिका



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1990-92

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EDITORIAL

Nepal Geological Society is pleased to bring this issue of News Bulletin on the auspicious occasion of 42nd anniversary of National Democracy Day of Nepal. The Society takes this opportunity to express its deep gratitude to martyrs who sacrificed their lives for the cause of democracy in Nepal.

The people's democratic movement of 2046 (1990) has opened an environment of strengthening and promoting the application of science and technology for national development. In this context, the Society feels that the government should carry out radical changes in the beaurocratic set up of the country in order to keep the scientists, engineers, doctors and administrators deeply engrossed in their respective duties.

The Society is committed to its objective of developing and promoting the application of geological sciences to national development. It has, therefore, further expanded its professional activities both in national and international levels. In the year 1991, the Society has organised the one day Seminar cum workshop on "Geologic Hazards, Environment and Man- Made structures", five scientific lectures by national and international earth scientists. Two issues (volume 7 and volume 7 special Issue) of the Journal of Nepal Geological Society and one issue of News Bulletin have been published. Besides, Brochure of Nepal Geological Society, which highlights the Society's objectives, activities and publications has also been brought out. Suggestions have been forwarded to the High Level Administration Improvement Commission reflecting the views of Nepalese geologists. During 1991 fourteen national and international earth scientists have been awarded life membership and eight national graduates- associate membership. By December 1991, the Society has awarded membership to 251 earth scientists and engineers, and associate membership to 40 earth science graduates and people involved in mineral industry.

The national members of the Society are constantly upgrading their professional standard. During 1991 about 25 national members of the Society have participated in 10 different seminar/conference or workshops held in Nepal or abroad. About 36 of them completed either Diploma course or training/workshop programmes in 17 different subjects. The Society presents itself a strong scientific community of geologists, mining engineers and geotechnical engineers capable of providing expertise and expert opinion to the government and other agencies for effective utilisation of natural resources, mitigation of natural and man- caused hazards as well as protection of the environment of the country.

The Society extends its best wishes to all its readers for happy and prosperous 1992.

Best Wishes and Hearty Felicitations
on the
auspicious occasion
of

42nd National Democracy Day

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NGS News

1. The Nepal Geological Society has published its "Brochure" in January, 1991 with a view to disseminate information on the objectives and professional activities of the Society. The Brochure is being distributed free of cost.
2. The Society has organised five lecture programmes in 1991 by national and international earth scientists, all of which are members of the Society. Details are provided separately under "Lecture Programmes in 1991" in this Bulletin.
3. Two issues of the Journal of the Nepal Geological Society have come out in 1991. The regular issue of the Journal i.e. volume 7 has been published in June 1991, whereas the proceedings of the seminar on "Geology of Nepal Himalaya" organised on August 25, 1989, have been published as an Special Issue of volume 7 of the Journal.
4. An agreement has been signed by Mr. A. N. Bhandary, President of the Nepal Geological Society and Prof. V.V.J. Sarma Secretary and Treasurer of the Association of Hydrologists of India on July 10, 1991 to organise an international seminar on "Hydrology with a Special Colloquium on Environmental Problems and Water Resources of Himalayan Region" in Kathmandu. The Seminar may be held during Nov. 10—12, 1992 with a field trip during Nov. 13—15, 1992. This agreement was reached following a series of meetings between the President, the Secretary and some members of the Nepal Geological Society and the Secretary and Treasurer of Association of Hydrologists of India during July 2—10, 1991.
5. The Royal Nepal Academy of Science and Technology has provided a grant assistance of Rs 9,000 to the Society for fiscal year 2047/2048 (1990/1991) on Asadh 32, 2048 (July 16, 1991). In the letter addressed to the Society it is said that the decision on financial assistance is taken following the annual professional activities of the Socie-

ty. The Society used that money for the publication of volume 7 of the Journal of the Nepal Geological Society, which required a total cost of about Rs. 18,000.00.

7. The twelfth annual General Body of the Nepal Geological Society met on September 6, 1990 in the auditorium of the Department of Mines and Geology in a cordial atmosphere under the chairmanship of Mr. A. N. Bhandari, the President of the Society. The Secretary and the Treasurer presented their annual reports. The presentation of the reports was followed by discussion on current geologic events relating to Seti Bridge damage at Pokhara and Bagmati Bridge damage at Kathmandu. Many members expressed their views and opinions in this issue as well as in other issues and also made suggestions to the Executive Committee.

8. The twelfth annual General Body meeting has decided to raise the price of the Journal from Rs. 15.00 to 25.00 for the members and from Rs. 50.00 to Rs. 75.00 for non-members effective from October 1, 1991.

6. Mr. Gopal Singh Thapa, Life Member of the Nepal Geological Society has been appointed General Manager of Udayapur Cement Industries Ltd. [Udayapur, Nepal on September 9, 1991.

10. Mr. A. N. Bhandari stepped down as the Co-ordinator of NGS - IDNDR council in the meeting of that council members on September, 91 in view of his occupancy in other affairs of the Society. The same meeting nominated Mr. A. M. Dikshit as the co-ordinator of that council.

11. The ninth meeting of the Executive Committee of the Nepal Geological Society held on Sept. 20, 91 has reviewed the prices of the Journal of the Nepal Geological Society as follows effective from October 1, 1991

Countries	Member	Non-member
Nepal	Rs. 25	Rs. 75
SAARC	US \$ 2	US \$ 6
Other countries	US \$ 4	US \$ 8

12. The Nepal Geological Society organised a one day seminar cum workshop on "Geologic Hazards, Environment and Man-made Structures" on October 7, 1991 to commemorate the International Decade for Natural Disaster Reduction (IDNDR) Day. The Seminar cum workshop was organised in the hall of Social Services National Coordination Council (SSNCC) at Lainchaur, Kathmandu. It was sponsored by the following consulting firms :

EAST Consult (P) Ltd.

GEOCHE Consultants (P) Ltd.

ITECO Nepal (P) Ltd.

Multi Disciplinary Consultants (P) Ltd.

SILT Consultants (P) Ltd.
Shuva Simha Consult (P) Ltd.

13. The Nepal Geological Society has forwarded suggestions to the High Level Administration Commission on Marga 10, 2048 (November 26, 91) following discussion among several members of the Society.

14. The tenth meeting of the Executive committee of the Society held on January 1, 1992 has decided to appoint Dr. David Scott Silverberg as the Foreign Regional Representative of the Society in America instead of Dr. Durga Nath Rimal. This decision has been taken following no reply from Dr. Rimal. Dr. Silverberg has verbally agreed to carry out this responsibility during discussion with the Secretary and other members of the Society in Kathmandu in November, 91.

15. The tenth meeting of the Executive Committee has also fixed the following rates for advertisements in News Bulletin.

Cover page (back)	—	Rs. 1500.00
Cover page (Inside)	—	Rs. 1200.00
Full page	—	Rs. 900.00
Half page	—	Rs. 500.00

16. The same meeting of the Executive Committee delegated full responsibility to the Scientific Sub-committee to organise

the seminar on " Hydrology with a Special Colloquium on Environmental Problems and Water Resources of Himalayan Region. "

17. Ten members of the Nepal Geological Society are to participate in the First South Asia Geological congress (GEOSAS-I) to be held on February 23-27, 1992 in Islamabad, Pakistan. Mr. S. P. Singh, Director General of the Department of Mines and Geology is participating in the Congress on official invitation from Ministry of Petroleum and Natural Resources, Government of Pakistan.

Dr. R. P. Bashyal, ex-President of the Society is leading the official delegation to the Congress. The members of the official delegation are N. D. Maskey, Mr. P. R. Joshi, Mr. B. M. Jaawali, Mr. K. P. Kaphle, Mr. J. N. Shrestha and Mr. K. M. Amatya.

Dr. G. Gabert, Leader of the German Geological Advisory Group to DMG and Dr. P. Gauvain, lecturer, Tribhuvan University are also to participate in the Congress.



Best Wishes and Hearty Felicitations
on the
auspicious occasion
of
42nd National Democracy Day

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नेपाल भौगर्भिक समाजको बाह्रौं वार्षिक साधारण सभा

नेपाल भौगर्भिक समाजको सेप्टेम्बर ९, १९८१ मा आयोजना गरिएको बाह्रौं वार्षिक साधारण सभामा सचिव श्री तारा प्रसाद अधिकारी र कोषाध्यक्ष श्री ध्रुव प्रसाद अधिकारीले प्रस्तुत गर्नु भएको प्रतिवेदनहरूको साथै तत्पश्चात् सभामा भएको छलफल तल प्रस्तुत गरिएका छन् ।

(क) सचिवको प्रतिवेदन

श्री सभापतिष्यु तथा सदस्य साथीहरू,

सर्वे प्रथम नेपाल भौगर्भिक समाजको बाह्रौं साधारण सभामा उपस्थित यहाँहरू सर्वलाई कार्यकारिणी समितिको तर्फबाट हार्दिक स्वागत गर्दछु ।

साथीहरू, यस छैटौं कार्यकारिणी समितिले समाजको कार्यभार सम्हालेको पनि एक वर्ष पूरा भएको छ । यस एक वर्षको अवधिमा समाजले गरेको विभिन्न क्रियाकलापहरू वारे विवरण पेश गर्ने पाउँदा धेरै खुशिलेको छ । समाजको स्थापना काल देखि नै सदस्य साथीहरूले बेलाबेलामा व्यक्त गर्नु भएको आकांक्षा, चाहना एवं मुशावहरूलाई हृदयङ्गम गरी यस कार्यकारिणी समितिले समाजलाई त्यसै अनुरूप भन्नाइ बढाउन प्रारम्भिक पाइलाहरू चाल्न थाल्न गरेको व्यहोरा निवेदन गर्दछु ।

१. सामूहिक निर्णय र व्यक्तिगत जिम्मेदारीको भावना अनुरूप कार्यकारिणी समितिले आफ्ना प्रत्येक सदस्यलाई खास खास कामको जिम्मा दिइ अन्य सदस्य साथीहरूको समेत सक्रिय सहयोग प्राप्त गरी समाजको क्रियाकलाप भन्नाइ बढाउन विभिन्न ७ उपसमितिको गठन गरेको यहाँहरूलाई विदित छ ।

२. नेपाल भौगर्भिक समाज तथा यसका क्रियाकलापहरू देश भित्र तथा बाहिर भन्ने बढी व्यापकता दिन प्रचार सामाग्रीको रूपमा नेपाल भौगर्भिक समाजको त्रिशर गत मङ्सरी १९८१ मा प्रकाशित गरी वितरण गरिएको छ । यस प्रकाशनमा संलग्न रही सक्रिय सहयोग दिने साथीहरूलाई धन्यवाद दिन चाहन्छु । यस्तो त्रिशर प्रत्येक दुई वर्षमा एक पटक प्रकाशित गर्दै लैजानु पर्दछ भन्ने हाम्रो धारणा रहेको छ ।

ब्रोशरको वितरण समाजका सदस्यहरू बिच मात्र सिमित नराखी स्वदेशी तथा विदेशी गैर सरकारी र सरकारी संस्थानहरूमा पनि वितरण गरिएको छ । यस्ता प्रकाशनले स्वदेशी तथा विदेशी भूगर्भविद तथा भू-इन्जिनियरहरूको यस समाज प्रति धन्य बढी अभिरुचि जगाउनेछ भन्ने हाम्रो विश्वास छ । तर समाजको वैज्ञानिक अनुहार माथि उठाउन यसका वैज्ञानिक क्रियाकलापहरूमै जोडिनु पर्दछ भन्ने हामीले ठानेका छौं ।

३. हाम्रा वार्षिक प्रकाशनहरू (समाचार पत्रिका तथा वैज्ञानिक पत्रिका) लाई नियमित र तोकिएको समयमै प्रकाशित गर्नु पर्दछ । यसले समाजको राष्ट्रिय तथा अन्तरराष्ट्रिय छविलाई माथि उठाउनेछ । त्यसैले न्यूज बुलेटिन प्रत्येक वर्षको फेब्रुअरि (फाल्गुन ७ गते) मा प्रकाशित गर्नको लागि मध्य जनवरी सम्ममा प्रकाशन सामग्रीहरू प्रबन्ध सम्पादक कहाँ पुगी सक्नु पर्ने र जनल प्रत्येक वर्ष जुन महिनामा प्रकाशित गर्ने फेब्रुअरी महिना भित्र वैज्ञानिक लेखहरू प्रबन्ध सम्पादक कहाँ पुगि सक्नु पर्ने प्रावधानको थालनी गरिएको छ । यस वर्षको (१९६१) News Bulletin vol. 8 र Journal of Nepal Geological Society vol. 7 प्रकाशित भई वितरणमा आइसकेको छ । उपरोक्त प्रकाशनहरू प्रकाशक गर्ने सम्पादक मण्डलका सम्पूर्ण सदस्यहरूले खेलेको सक्रिय भूमिकाको कदर गर्दै हादिक धन्यवाद दिन्छु साथै यस कार्यमा प्रत्यक्ष वा परोक्ष रूपमा सहयोग पुऱ्याउने सबै साथीहरूलाई धन्यवाद दिन चाहन्छु । वैज्ञानिक लेखहरू ठिक समयमा जम्मा हुन नसकेकाले तोकिएको बेलामा उक्त प्रकाशनहरू निस्कन सकेनन् ।

त्यसैले आउँदा बर्षको लागि लेखहरू समय भित्रै उपलब्ध गराइदिएको लागि सदस्य साथीहरूको सक्रिय सहयोगको अपेक्षा गर्दछु ।

४. गत सालमै प्रकाशित भई सक्नु पर्ने "Proceedings of the Seminar on Geology of the Nepal Himalaya" हालै केही हप्ता भगाडि मात्र सहयोगी प्रेसमा प्रकाशनार्थ पुगेको छ । चाँडै नै सदस्य साथीहरू सामु आइपुग्नेछ भन्ने आशा एवं विश्वास लिएको छु ।

५. विदेशी भूवैज्ञानिकहरू द्वारा बेला बेलामा प्रवचन कार्यक्रम आयोजना गराउने हाम्रो परिपाटी कायम नै राखी नेपाली भूवैज्ञानिक तथा भू इन्जिनियरहरू द्वारा पनि सकभर महिनाको एक पटक प्रवचन कार्यक्रम आयोजना गर्ने विचार बमोजिम यस कार्यको थालनी भएको छ । अगष्ट ६, १९६१ मा डा. मेघ राज धितासले "Stratigraphy and Structure of Dang Sallayan Area in Nepal Lesser Himalaya" विषयमा प्रवचन दिनु भएको थियो । वक्ताहरूको नामावली अग्रिम प्रकाशन गरी यस कार्यक्रमको सञ्चालन कायम राख्न पुनः साथीहरूको सहयोगको अपेक्षा गरेको छु । अर्थ संकलन राम्रो भएमा यस्ता प्रवचनहरूको संकलन गरी "Lecture Series" प्रकाशन गर्ने सम्भावना तर्फ पनि हाम्रो ध्यान गएको कुरा अवगत गराउन चाहन्छु ।

साथीहरू, यस समाजले गत एक वर्ष भित्रमा विदेशी वैज्ञानिक द्वारा जम्मा तीन वटा प्रवचन कार्यक्रमको आयोजना गरेको थियो । सर्वप्रथम अक्टोबर ७, १९६० मा डा० जोन ए ट्यालेन्टले बुद्ध

हुइ विषय "Evolution of Asia from formerly discrete crustal blocks र Around the world with V. J. Gupta" विषयहरूमा प्रवचन दिनु भएको थियो। त्यसपछि मे २६, १९९१ मा डा. ए. पेचे (Pecher) ले Kinematics of the Higher Himalayan crystallines" विषयमा प्रवचन दिनु भयो। यस वर्षको अन्तिम वक्ता डा. ले. फोर्ट जुन ७, १९९१ मा A model for the Generation of the Himalayan Leucogranites विषयमा प्रवचन दिनु भयो। हाम्रा स्वदेशी तथा विदेशी वक्ताहरूलाई हार्दिक धन्यवाद ज्ञापन गर्दछु। साथै प्रवचन कार्यक्रमको आयोजना तथा सञ्चालन गर्ने वैज्ञानिक उपसमितिलाई पनि धन्यवाद दिन्छु।

३. माथि उल्लेखित विषय बाहेक सेमिनार, गोष्ठी आदि समुक्त रूपमा आयोजना गर्ने तर्फ पनि कार्य-कारिणी समितिको ध्यान गएको छ। हाम्रा वैदेशिक यूरोपिय क्षेत्रिय प्रतिनिधि डा. प्याट्रिक ले. फोर्ट संग जुन ८, १९९१ मा अध्ययनार्थ तथा मैले भेटी भविष्यमा संयुक्त रूपमा Franco-Nepal seminar / Work shop आयोजना गर्ने सक्ने सम्भावना बारे सकारात्मक छलफल भएको थियो।

त्यस्तै गत जुलाईमा समाजको निमन्त्रणामा काठमाडौं आउनु भएका Andhra University Vishakhapatnam का प्रोफेसर तथा Association of Hydrologists of India (AHI) का सचिव श्री भि. भि. सर्मा संग पनि यसै विषयमा औपचारिक कुराकानी भएको थियो। Association of Hydrologists of India

र Nepal Geological Society को संयुक्त तत्वावधानमा १९९२ को नोभेम्बर ८ तिर Hydrology of Himalayan Region सम्बन्धि अन्तरराष्ट्रिय सेमिनार नेपालमा आयोजना गर्नको लागि बुबै संस्था बिच मिति १० जुलाई १९९१मा सहमति भएको छ। यस्ता सेमिनार आयोजना गर्ने ठूलो घनराशीको आवश्यकता पर्ने हुँदा हामी उता-तिरबाट पत्रको प्रतीक्षामा छौं र यस कार्यक्रमको अन्तिम टुङ्गो लाग्न अझै केही समय लिनेछ।

७. साथीहरू, यस बाहेक समाजले IGCP-National committee र International Decade for Natural Disaster Reduction National committee जस्ता समाजका उद्देश्यसँग मिल्दा जुल्दा राष्ट्रिय संस्थाहरूमा समाजको साथै सम्बन्धित वैज्ञानिक तथा प्राविधिकहरूको उचित भूमिका र प्रतिनिधित्व हुनु पर्ने विषयमा सम्बन्धित निकायहरूमा हामीले अभिरुचि दर्शाएका छौं। यस कार्यमा सदस्य साथीहरूबाट प्राप्त समयोगको लागि धन्यवाद दिन चाहन्छु र अझ बढी सक्रिय सहयोगको पनि अपेक्षा गर्दछु।

८. जनआन्दोलनको उपलब्धिलाई लिखित अभिव्यक्ति दिने दस्तावेजको रूपमा "नेपालको संविधान २०४७" जारी हुनु समस्त नेपाली जनताको महत्त्वपूर्ण ऐतिहासिक उपलब्धि हो। यसै सन्दर्भमा मानवीय मूल्यमा आधारित प्रजातान्त्रिक संविधानको घोषणा हुन बिलम्ब गरिएको विरोधमा समाज द्वारा एक वक्तव्य प्रकाशित गरिनुका साथै नेपाल व्यवसायिक ऐश्वर्यवद्धता समूह (Professional Solidarity Group) द्वारा आह्वान गरिएको न्यालीमा समाजले सक्रिय रूपमा भाग लिएको तथ्य साथीहरूलाई अवगत नै छ। यसमा सक्रिय रूपमा भाग लिई

प्रजातन्त्र प्रति आफ्नो आस्था र निष्ठा प्रकट गर्ने सम्पूर्ण सदस्य साथीहरूलाई हादिक धन्यवाद ज्ञापन गर्दछु ।

८. राज्यको चौथो भङ्ग मानिएको पत्रकारिता जगत माफत हाम्रा जस्ता वैज्ञानिक संस्था र विषय सँग सम्बन्धित जानकारी साधारण जनता बिच पुर्‍याउन प्रभावकारी हुने हुँदा हामीले नेपाल बातावरण पत्रकार समूह सँग भेटघाट कुराकानीका साथै भूविज्ञान एवं बातावरण सम्बन्धमा पत्रकारहरूलाई साधारण जानकारी गराउने उद्देश्यले सदस्य साथीहरूले प्रवचन कार्यक्रमको शुरुवात गर्नु भएको व्यहोरा निवेदन गर्दछु ।

९. साथीहरू समाजको कार्यालय स्थापना गर्ने जग्गा प्राप्तिको लागि उद्योग मन्त्रालय र भ्रम तथा सामाजिक कल्याण मन्त्रालयमा समाजको तर्फबाट निवेदन दिइएको र यस विषयमा तत्कालिन उद्योग मन्त्री र भ्रम तथा सामाजिक कल्याण मन्त्री सँग वार्ता पनि भएको थियो । यस सम्दर्भमा भ्रम तथा सामाजिक कल्याण मन्त्रालयले भूमिसुधार मन्त्रालयलाई पत्र लेखि पठाएको छ । हाम्रो यस प्रयास सफल होला भन्ने आशा लिएका छौं तर पनि वैकल्पिक ठाउँहरूको खोजी जारी छ । यस कार्यमा साथीहरूको सुझाव र सहयोगको अपेक्षा गर्दछौं । यस कार्यलाई सम्पूर्ण रूपमा अघि बढाउने आर्थिक सहयोग संकलन उप-समितिलाई धन्यवाद दिन चाहान्छु ।

११. सदस्य साथीहरू, हाल नेपाल भौगोलिक समाजको सदस्य संख्या गत वर्षको संख्या २३१ बाट बढेर २४३ पुगेको छ । यस वर्ष नयाँ सदस्यता लिने १२ जना साधारण सदस्यले पनि आजीवन सदस्यता लिनु भएको छ । यसरी भव्य समाजको आजीवन सदस्य

संख्या १६७ पुगेको छ । म यसरी नयाँ साथीहरूको समाज प्रतिको समिकृतिको कदर गर्दछु र बर्हाहरू लाई बढाई ज्ञापन गर्दछु ।

१२. हामीले प्रत्येक वर्ष राजकीय विज्ञान तथा प्रविधि प्रज्ञा प्रतिष्ठानबाट आर्थिक सहयोग पाइराखेकोमा यस पटक पनि रु. १००००/- प्राप्त गरेका छौं भने म्युज बुलेटिन ओलुभ c मा विज्ञापन दिने विज्ञापन दाताहरू मध्ये १३ जनाबाट ६२१००/- पनि प्राप्त भैसकेको छ । बाँकी रु. ५०००/- पनि प्राप्त हुने क्रममा छ । अन्य ग्राम्बानी तथा खर्चको विवरण कोषाध्यक्षज्यूको प्रतिवेदनबाट ज्ञात हुने छ ।

१३. आर्थिक पक्षमा समाजलाई अझ बढी सफल तुल्याउने हेतुले आर्थिक सहयोग संकलन उपसमितिलाई विभिन्न व्यक्ति तथा संस्था सँग संपर्क राख्ने विर सोचाइ भइरहेको छ ।

१४. US Librery of congress Spring Trading Book co., Hongkong को साथै Green Librarv, USA मा हाम्रो सम्पूर्ण वैज्ञानिक प्रकाशनहरू पठाइ सकिएको छ र उनीहरू सँग हाम्रो समाजको संबन्ध कायम राखी अरु यस्तै संस्थाहरू सँग संबन्ध बढाउँदै लैजाने व्यहोरा निवेदन गर्दछु ।

अन्त्यमा समाजको विभिन्न क्रिया-कलापमा सहयोग पुर्‍याउने सम्पूर्ण सदस्य साथीहरू, विज्ञापन दाताहरू, नेपाल विज्ञान तथा प्रविधि प्रज्ञा प्रतिष्ठान, खानी तथा भूगर्भ विभाग, भूगर्भ विभाग त्रि-चन्द्र क्याम्पसलाई हादिक धन्यवाद ज्ञापन गर्दछु । साथीहरूको सुझाव तथा सहयोगको अपेक्षा गर्दै यो प्रतिवेदन यही टुक्छु ।

धन्यवाद
सेप्टेम्बर ९, १९९१
काठमाडौं

(ख) कोषाध्यक्षको आय व्ययको प्रतिवेदन

श्रीमान् अध्यक्षज्यू तथा उपस्थित साधीहरू,

सर्वे प्रथम मलाई नेपाल भौगोलिक समाजको कोषाध्यक्ष पदमा विजय गराई यस समाजको सेवा गर्ने मौका दिनु भएकोमा म संपूर्ण साधीहरू प्रति आभार व्यक्त गर्दछु ।

विगत वर्षहुकमा कोषाध्यक्षलाई गरेका अपठधारा र लेखा परिक्षकले दिएको सुझावहरूलाई दृष्टिगत गरी मैले यस पाला देखी Ledger Book, Cash Book, Stock Book, Voucher र भर्पाई

प्रचलनमा ल्याई चलन चल्तीको लेखा प्रणाली अपनाएको छु । यस कार्यमा सहयोग गर्ने उद्योग मन्त्रालयका वडा लेखापाल श्री बाबुराज बज्राचार्यलाई धन्यवाद ज्ञापन गर्दछु ।

२०४७ भाद्र २६ गते देखि २०४८ आश्विन ३१ सम्म जम्मा रु. २४,२१७।४० आम्दानी भई रु. १६,५०५ मात्र खर्च भएको छ । आय व्ययको विवरण निम्नलिखित आम्दानी खर्चको Balance Sheet बाट स्पष्ट हुनेछ ।

NEPAL GEOLOGICAL SOCIETY

Receipt & Payment Account for the year

26 th Bhadra 2047 to 31st Shrawan 2048

Receipt	Amount Rs	Payment	Amount Rs.
To Cash and Bank	153,920/63	By Salary+Remuneration	445/-
Balance		By Advertising+Stationary	6,204/80
		By Refreshment & Hospitality	1,326/-
To Life Member Fee	5,650/-	By Printing, Process of Journal and Bulletin	7,050/-
i. Up-graded Rs. 500/-		By Printing and Typing	283/-
ii. New Rs. 5,150/-		By Postage and Telegram	841/60
		By Renewal and Regn	225/-
To Membership Fee	50/-	By Taxi Fare and Fuel	89/-
i. Renewal (ord) Rs. 50/-		By Tax on interest
ii. New (ord)		By Miscellaneous Expenses	40/60
			16,505/-
To Advertisement Receipt	5,750/-	By Cash & Bank Balance	1,61,453/23
To Sales of Journal	3,767/60	NABIL Bank (Fixed)	69,000/-
To Interest from saving and Fix deposit A/C	NABIL Bank (Sav.)	41,596/42
		NBL Bank (Curr.)	39,299/68
		NBL Bank (Sav.)	3,605/78
To financial Aid (Ronast)	9,000/-	Cash in hand	7,951/35
			1,61,453/23
		Suspension A/C	180/-
	1,78,138/23		1,78,138/23

(ग) छलफल

सचिव तथा कोषाध्यक्षबाट प्रतिवेदनहरू प्रस्तुत गरिएपछि बैठकले विभिन्न सवस्य साधीहरू द्वारा उठाइएका समसामयिक प्रश्नहरू माथि छलफल गर्‍यो । केही सदस्य साधीहरूले उठाउनु भएको प्रश्नहरू माथि कार्य-कारिणी समितिका सदस्यहरूले जवाफ दिनु भयो भने केही सदस्य साधीहरूले कार्यकारिणी समितिलाई सुझाव पनि दिनु भयो । मुख्य अंशहरू यहाँ प्रस्तुत गरिएका छन् ।

१. सर्व प्रथम डा. श्री मेष राज घिसालले जनल भोलुम ७ मा भएका छपाई संवन्ध केही लुटीहरू झोल्याउनु भयो र जनलमा अक्षरको ढाँचा तथा अन्य कुराहरू ठेगान गरी सुधार गर्दै जानु पर्ने सल्लाह दिनु भयो ।

२. पोखरामा सेती पुल भत्केको शिलशिलामा समाजले के गर्दैछ भन्ने प्रश्न श्री माधव राज पाण्डेले गर्नु भयो । यसमा बहाले पोखरामा पहिले गरिएको भौगमिक अध्ययनलाई पनि हवाल गरी उक्त क्षेत्रमा निर्माण कार्यहरू गर्दा के कस्तो प्रतिरोधात्मक उपायहरू अपनाउनु पर्छ सो संवन्धमा समाजले सल्लाह दिनु पर्ने कुरा बताउनु भयो । श्री पाण्डेले पूर्वी नेपालमा भैचालो जाँदा समाजले डा० तोरण शर्मा र डा० दिव्य रत्न कंसाकारलाई त्यस तर्फ

पठाएको कुरा पनि स्मरण गराउनु भयो ।

समाजको तर्फबाट भूगर्भविद्हरू पोखरा पठाउने बारे डा. श्री विशाल नाथ उप्रेती र श्री जगदीश्वर नाथ श्रेष्ठले विचार गरौं भन्नुभयो । पोखरामा घटेको जस्तो कसैमा घटना घटी सकेका छन् र अन्य ठाउँमा पनि घटन सक्ने स्थिति भएकोले यसमा राम्ररी विचार गर्नु पर्ने देखिन्छ भनी डा. पित्तम्बर गौतमले भन्नु भयो ।

उठेको प्रश्नको जवाफ दिदै सचिव श्री तारा प्रसाद अधिकारीले सेती पुल भत्केको बारे का. का. स. लाई ज्ञान भएको तर केही भूगर्भ विद्हरू खानी तथा भूगर्भ विभागको तर्फबाट आज त्यस घटनाको अध्ययन गर्न जानु भएकोले समाजले छुट्टै प्राविधिक त्यस तर्फ पठाउने कुनै विचार नगरेको कुरा बताउनु भयो । पोखराको संवन्धमा उपलब्ध भौगमिक प्रतिवेदनहरू आदि हेरेर के गर्न सकिन्छ सो विचार गर्ने आश्वासन अध्यक्ष श्री अरुणतानन्द भण्डारीले दिनु भयो ।

३. श्री कल्याण देव भट्टराईले मेलास्ची खानेपानी योजना सँग सम्बन्धित केही भौगमिक कुराहरूमा

पत्र पत्रिकामा चलेको वाद विवादको संस्मरण गराउनु भयो र यस वाद विवाद संबन्धि कुराहरू हेर्ने एउटा उपसमिति गठन गर्ने कि भनी प्रश्न गर्नु भयो । यस संबन्धमा डा. श्री मेघ राज धितालले भौगमिक विषयमा अन्य विषयका प्राविधिकहरूले व्याख्या गर्ने प्रकृया राम्रो नभएकोले समाजले प्रतिक्रिया देखाउनु पर्ने कुरा बताउनु भयो । श्री जगदीश्वर नाथ श्रेष्ठले यस वाद विवाद संबन्धमा समाजको प्रतिक्रिया खोई भनी प्रश्न गर्नु भयो भने डा. श्री पोताम्बर पौतमले यस संबन्धमा समाजले प्रतिक्रिया दिन पर्ने जस्तो नसार्नेको विचार व्यक्त गर्नु भयो । श्री जगदीश्वर नाथ श्रेष्ठले समाज वा भौगमिक पेशामा दाग पर्ने कतिमको कुनै कुरा उठेमा प्रतिक्रिया जनाउनको लागि पनि एउटा छुट्टै उपसमिति गठन गर्ने कि भनी सुझाव दिनु भयो । उपसमितिको संख्या बढाएर मात्र समस्याको समाधान नहुने कुरा सचिव श्री तारा प्रसाद अधिकारीले बताउनु भयो ।

४. डा. श्री चन्द्र क्रान्त शर्माले नेपालका विभिन्न ठाउँमा धाई पर्ने सबै प्राविधिक समस्याहरूमा समाजले हात हाल्न सक्दैन भन्नु हुँदा समित कुराहरूमा बोल्न समाजले प्रवक्ता नियुक्त गर्नु पर्ने र सो व्यक्त सँग सरकारी पेशाको हुनु पर्ने राय व्यक्त गर्नु भयो । जल्दो बलदो प्रश्नमा समाजले प्रतिक्रिया देखाउनु पर्ने र प्रवक्ताले वैज्ञानिक उपसमितिको राय बमोजिम बोल्नु पर्ने विचार वहाँको थियो । प्रवक्ता नियुक्त गर्ने सपने कुरा डा. श्री मेघ राज धिताल, श्री देवी बहादुर थापा र श्री कल्याण देव भट्टराईले व्यक्त गर्नु भयो र संबन्धित प्राविधिक कुराहरूमा

वैज्ञानिक उपसमितिले नै राय दिए पुग्ने विचार व्यक्त गर्नु भयो । साथै श्री कल्याण देव भट्टराईले समाजले सबै प्रश्नको जवाफ दिनु पर्छ भन्ने छैन पनि भन्नु भयो ।

अध्यक्ष श्री अच्युतानन्द भण्डारीले प्रजातान्त्रिक परिपाटीमा सबै सदस्यले लेखन र बोल्न पाउनु पर्छ भन्ने हाम्रो धारणा छ यसर्थ प्रतिक्रिया कार्यक्रमारिणी समितिबाट मात्त होइन कि समाजका सदस्यबाट पनि आउनु पर्छ भन्नु भयो । वैज्ञानिक उपसमितिका सदस्य मात्र होइन कि जुन विषयमा जुन सदस्य दक्ष छ उसको विचार उपसमिति माफुस पठाउन वैश हुनेछ भन्ने वहाँको भनाई थियो । डा. श्री चन्द्र क्रान्त शर्मा भन्नु भयो कि भारत, अमेरिकामा पनि समाजले प्रतिक्रिया देखाएको पाईदैन भन्नुभयो । सचिव श्री तारा प्रसाद अधिकारीले समाजले प्रतिक्रिया दिदा गहिरेर विचार गर्नु पर्छ भन्नु भयो । के के कुरामा प्रतिक्रिया दिने भन्ने कुरा कार्य कारिणी समितिले निर्घो गर्नेछ भनी अध्यक्ष अच्युतानन्द भण्डारीले बताउनु भयो ।

५. नेपालका पत्रकारहरूलाई कुन विषयमा को विशेषज्ञ हो भन्ने ज्ञान नभएकोले भूगर्भविद्हरूको भूमिकाको बढी प्रचार हुनु पर्नथो भनी डा० श्री मेघ राज धितालले सुझाव दिनु भयो भने श्री राजेन्द्र प्रधानले पत्रकार सम्मेलन गराएर भूगर्भको ज्ञान गराउन वैश होला भन्नु भयो ।

६. श्री कृष्ण मुरारी अमात्यले भर्खरै स्थापना भएको बन तथा वातावरण मन्त्रालय संबन्धमा समाजको प्रतिक्रिया आएन भनी गुनासो गर्नु भयो । वातावरण बचाउमा भूगर्भविद्को भूमिका पनि त्यतिकै

महत्वपूर्ण हुने भएकोले उक्त मन्त्रालयमा भूगर्भ-विद्को उच्च पद सृजना हुनु पर्ने विचार व्यक्त गर्नु भयो ।

डा. श्री माधव प्रसाद शर्मा र डा. श्री रमेश बण्वालको वन मन्त्रालय सँग वातावरण गार्गीएर कसरी आएको समाजलाई जानकारी छ कि भन्ने प्रश्नमा अध्यक्ष श्री अच्युतानन्द मण्डारीले उक्त मन्त्रालयमा वातावरण पक्षलाई हाल चिफ फरेष्ट अफिसर अन्तरगत राखिएको छ तर वातावरण सँग संबन्धित सबै विशेषज्ञहरूलाई साथमा राखेर लैजानु पर्ने हाम्रो धारणा छ भन्नु भयो । यस संबन्धमा समाजको तर्फबाट सकारात्मक सुझाव दिन वेला हुने राय श्री कल्याण श्रेव भट्टराईले व्यक्त गर्नु भयो । वहाँले वातावरणलाई वन सँग राख्न नहुने भन्ने सुझाव दिएर फाइदा छैन बरु खप के राख्नु पर्छ मात्र भन्नेको खण्डमा सुन्नु भन्नु भयो । श्री कृष्ण मुरारी अमात्यको विचारमा पनि नकारात्मक पक्षमा जानु हुँदैन भन्ने भियो । श्री प्रताप सिंह तातेडले वातावरणको औशर बनाएर पठाउने सल्लाह दिनु भयो । डा० श्री मेघ राज धितालको विचारमा समाजले वन तथा वातावरण मन्त्रालय जानु पर्छ र कुरा गर्नु पर्छ भन्ने भियो । डा० श्री चन्द्र कान्त शर्माले भन्नु भयो कि वातावरण वायोस्फियर र लिथोस्फियर दुवै सँग संबन्धित छ यसले यसमा विभिन्न बिषयहरूको संलग्नता हुनु पर्छ । वहाँले पनि समाजको अध्यक्षले एउटा प्रतिनिधि मण्डल लिएर जाने र ब्राह्मर जस्तो बनाएर पेश गर्ने सुझाव दिनु भयो ।

७. श्री टंकु प्रसाद शोशाले प्रसंग बदल्दै वार्षिक राक्षी भोज र पिकनिकको आयोजना यो वर्ष किन नभएको

भनी प्रश्न गर्नु भयो । यस प्रश्नको जवाफ दिदै श्री अच्युतानन्द मण्डारीले भन्नु भयो कि परम्परा राख्ने भएतापनि आर्थिक अवस्था राख्ने नभएकोले हुन सकेन । फेरि राक्षी भोजको लागि पैसा धेरै लाग्ने र समाजले धेरै नै थोरै मात्र व्यहोर्न सक्ने भएकोले सदस्यहरू माथि ठूलो भार पार्ने नचाहेकोले पनि आयोजना गरिएको हो । यसमा श्री तारा प्रसाद अधिकारीले प्रत्येक व्यक्तिलाई करीव रु. ३५००- उठाउनु पर्ने देखिएको र सो रकम उठाएमा धेरैको सहभागिता हुन नसक्ने देखिएको कुरा बताउनु भयो । वहाँले बेला बेलामा आयोजना गरिएको प्रवचन कार्यक्रमहरूले सदस्य साथीहरू बीच भेटघाट गराइ राखेको कुरा पनि बताउनु भयो ।

८. श्री कृष्ण प्रसाद काप्लेको समाजको सदस्यको लागि जर्नेलको मूल्य रु. १५०- बाट रु. २५०- गराउने प्रस्ताव सर्वसम्मतिबाट पारित भयो भने सदस्यता शुल्क चाहिँ यथावत नै राख्ने निर्धो भयो ।

९. समाजका विदेशी सदस्यहरूबाट जर्नेल नपाएको गुनासो आएको कुरा पनि श्री कृष्ण प्रसाद काप्लेले बताउनु भयो । यसमा श्री तारा प्रसाद अधिकारीले समाजले सबै विदेशी आजीवन सदस्यहरूलाई जर्नेल पठाउने नगरेको कुरा स्विकार्नु भयो र पठाएका जर्नेलहरू पनि टेगामा बदलिनाले फर्केर आएको कुरा उल्लेख गर्नु भयो ।

१०. श्री माधव राज पाण्डेले उपसमितिको सदस्यमा नियुक्त गर्दा नसोधिएको गुनासो व्यक्त गर्नु भयो । यसमा सबै जना सँग सोध्न नसकिएको तर विन्ध्या-समा कतिपय साथीहरूको नाम राखिएको कुरा श्री तारा प्रसाद अधिकारीले प्रष्ट पार्नु भयो ।

११. श्री कृष्ण प्रसाद काफ्लेले सर्व उपसमितिको काम सचिवको प्रतिवेदनमा नभएको टिप्पणी गर्दै शायद यसो हुनाको कारण का. का. स. का साधोहरू नै उपसमितिको संयोजक हुनु भएको र ग्रन्थ कामको व्यस्तताले बैठक बोलाउन पनि नसकिएको हो की

भन्ने प्रश्नमा श्री तारा प्रसाद अधिकारीले घेरै जसो उपसमितिको बैठक बसेको छ र भब चाडै नै ग्रन्थ उपसमितिको बैठक बोलाउने योजना भइ रहेको विचार प्रकट गर्नु भयो ।



**Best Wishes and Hearty Felicitations
on the
auspicious occasion
of
42nd National Democracy Day**

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Seminar Cum Workshop on Geologic Hazards, Environment and Man-Made Structures

Nepal Geological Society observed the IDNDR Day 1991 by organising a seminar cum workshop on "Geologic Hazards, Environment and Man-Made Structures." This one day forum was participated in by parliamentarians, politicians, academicians, social scientists, and practising engineers and scientists representing government departments, corporate institutions, academics and engineering consulting firms.

The seminar cum workshop was divided into three sessions. In the inaugural session, the importance of IDNDR in Nepal was highlighted by the speakers. Right honourable Mr. D. N. Dhungana, speaker of the House of Representatives was the Chief Guest and he delivered thought provoking speech on the necessity of maintaining harmony with Nature and invited the Nepalese scientists to help influence and educate the politicians and decision makers in mitigating natural hazards. The inaugural session was chaired by Mr. S.P.

Singh, Director-General of the Department of Mines and Geology. The president of NGS Mr. A. N. Bhandary delivered the welcome speech and Mr. A. M. Dikshit presented the overview of IDNDR in Nepal. Mr. K. Kunwar was the third speaker and he highlighted the importance of understanding the various natural hazards, incorporating the planning, design and construction of infrastructures in Nepal and offered cooperation on behalf of the engineering consulting industry of the country. Mr. T. P. Adhikary, Secretary of NGS presented the vote of thanks. The session was convened by Mr. R. K. Aryal.

The following two afternoon sessions were devoted to discussions on IDNDR activities in Nepal as well as on the natural hazards in the country. The first afternoon session was chaired by Dr. R. P. Bashyal. Dr. P. Gautam was the convener and Messers K. P. Kaphle, Dr. D. R. Kansakar were the rapport-

teurs, Four papers were presented in this session by Mr. A. M. Dikshit, Mr. N. D. Maskey and Mr. S. B. Upadhyaya.

Dr. M. P. Sharma chaired the second afternoon session which was convened by Mr. R. K. Aryal, Mr. J. Shrestha, Mr. U. Shaky and Dr. V. Dongol were the rappor-

teurs. Two technical papers on geological hazards in the Nepalese perspective were presented by Dr. T. Sharma and Dr. M. R. Dhital.

Abstracts of all the papers are given in the following page.



नेपाल भौगर्भिक समाजका अध्यक्ष श्री अच्युतानन्द भण्डारीज्यूबाट स्वागत भाषण

सभाको सभापति महोदय,
प्रमुख अतिथि सम्माननीय सभामुखज्यू
माननीय सांसदज्यूहरू,
आदरणीय अतिथिहरू,
नेपाल भौगर्भिक समाजका सदस्य साथीहरू,
महिला तथा सज्जनबन्धु

सर्वप्रथम म यहाँ उपस्थित सर्वे महानुभावहरूलाई स्वागत गर्दछु । हामी भूगर्भविद्हरूले २०३६ सालमा ३६ जना मिलेर भौगर्भिक विज्ञानमा खाली सरकारी तवरबाट मात्र काम गरेर पुग्ने गैर सरकारी संस्था (NGO) पनि चाहिन्छ भन्ने विचार गरी एउटा संगठन खोल्छौ । त्यसको नाम हो नेपाल भौगर्भिक समाज । अहिले यस सभासमा २०७१ जना सदस्यहरू छन् जसमध्ये ७० भन्दा बढी विदेशीहरू छन् । विदेशमा पनि समाजका सदस्यहरूले समाजको कार्यक्रम सक्रिय

रूपमा अगाडि बढाउन सक्नु भनेर शाखाहरू खोली वैदेशिक क्षेत्रीय प्रतिनिधिहरू नियुक्त गरेका छौ । अर्थात् हाम्रो समाजको गतिविधि स्वदेशमा मात्र होइन विदेशमा पनि बढाएका छौ । केही समय अघि जियोलाजिष्ट भन्नाले खानी खोज्ने इन्जिनियर मात्र भनेर बुझिन्थ्यो । बत्तल केही वर्ष भयो खानी मात्र होइन भूगर्भविद्हरूले हाम्रो देशमा रहेका अन्ध सम्पदाहरूको विकासमा र अन्य निर्माण कार्यहरू आदिमा ठूलो योगदान दिदा रहेछन् भन्ने देखिन लागेको छ । निर्माणका ती उदाहरणहरू जलश्रोतमा हेरो वा सडक, भवन या अन्य उद्योगमा सर्वेतिर हाम्रा भूगर्भविद् साथीहरूले आफ्नो योगदान दिनु भएको छ । यसै पनि ती योगदानहरू बर्हाइरहेका जति दिनु पर्ने हो, केही कारण बस जर्थात् केही हामीले खुसाउन नसकेर केही सरकारी तर्फबाट पनि बुझिदिन नसकेर, सो योगदान भन्दा पनि यथेष्ट हुन सकेको छैन ।

म दुइवटा कुरामा जोड दिन चाहन्छु। एउटा नेपालमा प्राकृतिक प्रकोपले हामीलाई पारेको छ। जसले २०१५ वर्षको गोरखापत्रमा प्रकाशित तथ्याङ्क अनुसार (२० वर्ष अघि १० वटा घटना मध्ये मायद २।४ वटा घटना मात्र प्रखारमा आउँदैनन्) १९८० को वर्षलाई आधार वर्ष मानी हेर्दा वर्षेनी पहिरोबाट मात्र ६० करोड रुपैयाँ बराबरको धनमाल नोक्सानी हुने गर्छ। त्यसैले यी प्राकृतिक उत्पादनहरूबाट हुने नोक्सानीलाई कसरी कम गर्ने सकिन्छ हामीले विचार गर्नु पर्छ। यिनीहरूबाट हुने असर ठप्पामै बन्द गर्ने सकिन्छ भन्ने त होइन, तर विज्ञान र प्रविधिको विकासले यिनीहरूबाट हुने असर कम गर्ने उपायहरू दिएका छन्। ती उपायहरू हामीले अवलम्बन गर्नु पर्छ भनेर संयुक्त राष्ट्र संघले १९९०-२००० को दशकलाई "प्राकृतिक उत्पात् न्युनिकरण अन्तरराष्ट्रिय दशक" International Decade for Natural Disaster Reduction भनी घोषणा गरेको छ। हामी यस दशकको दोस्रो वर्षमा छौं र नेपालमा यो कार्यक्रम संचालन गर्नेको लागि एउटा राष्ट्रिय समिति पनि बनेको छ। तर यस समितिको स्वरूप हेर्दा उद्देश्य अनुरूप बनेको छ भन्ने हामीलाई लाग्दैन। यो समितिमा डण्डा र झण्डावाल धेरै छन्। तर यो डण्डा र झण्डाको काम होइन। यो काम त प्राविधिकहरू, विशेषज्ञहरू र अन्य यस क्षेत्रसँग संचिछित व्यक्तिहरूको हो। त्यसैले हामीले श्री ५ को सरकारलाई अन्तरिम सरकार छुट्टा खेरी लिखित रूपमा हाम्रो विचार दिएका विषय र अरू देशमा कस्तो किसिमको समिति बनेको छ भनेर पनि एउटा उदाहरण अमेरिकाको दिएका विषय। हामी यो विचारलाई अहिले पनि जनता बीच र सरकार बीच पुऱ्याउने पक्षमा छौं। नेपालमा प्राकृतिक उत्पात्तहरूबाट बच्नको लागि हामीले के गर्ने सक्छौं भन्ने

कुरा हामी सरकारलाई बताउन राजी छौं। भर्खर म के भन्न चाहन्छु भने हामी यी धर्तीमा बस्छौं, हामीले विचार गर्नु पर्छ कि हामीले टेकेको धर्ती मुनी के छ? हामीले टेकेको धर्ती माथि के छ? हाम्रो देश हिमाल-यको परिवेश भित्र बाँधिएको छ। वातावरणको कुरा गर्दा खेरी पृथ्वी, यसको गर्भ, नदीनालाहरू, जलवायु सबैलाई नहेरी केवल बम र हरियालीलाई हेरेर पर्यावरण बुझेको ठहरिदैन। वातावरण मन्त्रालय खुलेको छ। हामीलाई खुसि छ वातावरण मन्त्रालय खुल्यो तर काम गर्दै जाँदा के के कठिनाई आईपलान् र यसलाई कसरी समाधान गर्ने भनी सुनियोजित तरिकाबाट विशेषकृत विचारहरू बुझेर परेको जस्तो लाग्दैन। यसरी केटाकेटी अवस्था देखि बिराएर चामिएका गलत पाइलाले ठिक गन्तव्यमा पुऱ्याउँदैन जस्तो लाग्दछ। यसर्थ यस विषयमा पनि नेपाल भौगोलिक समाज श्री ५ को सरकारलाई चाहिने जति योगदान दिन तत्पर छ। हामीलाई डर छ कहीं "प्राकृतिक उत्पात् न्युनिकरण अन्तरराष्ट्रिय दशक राष्ट्रिय समिति" बनाए जस्तै वातावरण मन्त्रालय नहोस्। यसमा हामी श्री ५ को सरकारलाई सहयोग गर्न इच्छुक छौं। म यहाँहरू सँग अब धेरै समय लिन्न। यति भन्दा यहाँहरूलाई फेरि स्वागत अभिवादन गर्दछु। यहाँहरूले यो सेमिनारमा उपस्थित भई दिएर हामी-हरूको होसला बढाइ दिनु भएको छ। विशेष गरेर सभामुखज्यूले यहाँ आईदिनु भएर हाम्रो होसला बढाई दिनु भएको छ। यस्तो सहयोग हामी यहाँहरू सबैबाट अभिध्यामा पनि अपेक्षा गर्दछौं।

सन्तोषाद

IDNDR and Nepal: Speech by Mr. Amod Mani Dikshit, Co-ordinator NGS-IDNDR Council

Honourable Chief Guest

Distinguished Guests

Ladies and Gentlemen

Back in 1964 the president of the United States National Academy of Sciences Dr. Frank Press proposed to launch an International Decade for reducing the effects of Natural Hazards. His proposal was very warmly responded upon by scientific as well as political communities of the world and United Nations General Assembly, first designated in 1987 and proclaimed in 1990, the last decade of this century, as the International Decade of Natural Disaster Reduction (IDNDR). It is envisaged during the Decade to foster concentrated international cooperation to reduce the loss of life and damage caused by the forces of nature by the application of the advancements in science and technology. The main aim is focused on developing countries which are suffering most and which are the one which have not been able to apply the advancement of science and technology,

which is already in the hands of mankind. That way IDNDR came into existence and second wednesday of October each year is proclaimed as the international Day for Natural Disaster Reduction.

We are going to celebrate this international Day two days in advance because of the several technical causes.

IDNDR addresses basically ten or so natural hazards including earthquakes, volcanic eruptions, landslides, tropical cyclones, floods, tsunamis, wild fire, droughts, locust infestations and industrial calamities of these, in our country earthquakes, landslides, floods and droughts are the main disaster types which are frequently found and the others are not that much wide spread. Of course, the disasters, as we know, never come alone. So there is another form of disaster called multiple disaster, one triggered by another which has its own specifics and also needs to be addressed.

The main concept of IDNDR, therefore, focuses on the problems of developing countries. It expresses the environmental concern. The main approach is the necessity of changing our attitude from that of fatalism to awareness and application of science and technology. Fatalism about natural disaster is no longer justified in view of our knowledge derived from the advancements of science and technology, which could be utilised to reduce these hazards effectively.

That way IDNDR puts at its main aim the reduction of natural hazards through concerted efforts specially in developing countries, the loss of life, property and social - economic disruptions caused by natural disasters. Emphasis is placed, firstly upon the integrated approach as opposed to hazard specific approach. Secondly, IDNDR concept places more stresses on activities directed towards prevention of hazards which include research, studies and application part, preparation of understandable programmes and preparedness. This emphasises on the development of warning system and communication. It stresses on the relief aspects also ensuring an effective post-disaster relief, rehabilitation programmes, communication with effective utilization of science and technology. The fourth aspect is research.

In this background I would like to review the conditions in Nepal with respect to

International Decade and its objectives and programmes. We are very happy that the Nepal Geological Society has responded to the call of United Nations and has formulated IDNDR council of the Society for facilitating IDNDR concept in Nepal and achieve the goals by identifying the problems of natural hazards and their solutions in the National perspective.

We have in Nepal, as already told by the President of NGS, one National committee on IDNDR formulated some two years ago. We have a feeling that this committee has not been able to respond as per the very objective of IDNDR itself. We find it very strange that even the government agencies, which are involved in the research and the studies of quite a few of natural disasters in this country like earthquakes, landslide, erosion floods etc. have not been represented in this National Committee. May be it is not at all necessary that every body should be represented but at least there should be somebody in the National committee to initiate activities in this direction. The academic field like the Department of Geology, Tribhuvan University does not find any place there. The committee does not seem to include representation from private sector and other pertinent social organisations. Very specific of this committee is that majority of its members are ex-officio members of the government i. e. they are high ranking officials of the government. That way it is some sort of an executive body

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rather than an advisory body. The other thing is that very little activity has been done in the last two years by the National Committee. The basic efforts of IDNDR is to bring knowledge to the doorstep of each man in the society but we so called learned people, geologists, hydrologists, engineers etc. do not know about the activities here. Now the necessity is to formulate the programme. We have to identify the hazards and formulate the specific programmes for the reduction of each and every individual hazard. It requires participation of concerned specialists, who are involved in the management of the hazard and concerned people, who are suffering from the hazards. Formulation of such programmes should be followed by their implementation. Individual agencies have done research works in some of the hazards, say the Department of Mines & Geology is doing survey of landslides and fundamental research on seismology of the country. The knowledge gathered is at one agency and the need is there to utilise the findings of the research by the persons who are involved in the implementation of the programmes. There is a tremendous lack of co-ordination. Hence, the Nepal National Committee on IDNDR needs the reformation.

There is another hindrance also. The official national term for Natural Disaster is "दैवी प्रकोप" which is largely a misnomer. I think that it has been wrongly taken up,

Literally it means "Godly very great anger". At the present level of knowledge of various natural phenomena I don't think we still should continue calling it "Anger of God". The case here is not this. The question may not be only the wording, but the effect of the wording. Etymology itself, I feel, is hindering against our efforts. So I call upon all of you to refrain from using this word "दैवी प्रकोप" for describing Natural Disasters or Natural Hazards. It should no longer be tolerated because this is what IDNDR calls to fight against.

Now, it is high time in Nepal to initiate programme for different hazards. Government agencies, academic fields and non-Governmental organisations should be widely involved in the formulation and implementation of related programmes. There is a lot of possibility of wider international cooperation in this field. Considering, as noted by our President, that the Himalayas have specifics of so many natural processes that this terrain may be a laboratory or a testing ground or an unique field for researches in so many problems in natural field. So many different kinds of landslides, not yet described in the literature, are found in Nepal. We should understand this and exploit this potential in the field of international as well as regional cooperation.

Lastly, we request the government to understand that the management of natural disaster should include four steps. Prediction, assessment of risks, preparedness plan and management of disaster itself. Till now the focus is only on the post disaster relief operation and clearing up only. This is wrong and against IDNDR concept. The focus should be shifted from post-disaster to pre-

disaster activity. We want to assure that Nepal Geological Society shall assist any national or international agency including Nepal's National Committee on IDNDR towards achieving the Decade's goals in this country. In the mean time we continue taking initiatives.

Thank you very much !



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International Decade For Natural Disaster Reduction And Private Sector In Nepal

*Speech by Mr. K. Kunwar**

It is a pleasure for me to note that representatives of a very wide spectrum of the society are meeting here on the occasion of the UN declared International Day for Natural Disaster Reduction. I find it very much symbolic because it is some sort of recognition of the fact that confronting natural disaster is a skill which can be effectively achieved only by a joint and concerted efforts on the part of individuals and institutions belonging to government, academic, educational and private sectors.

Nepal faces a variety of Natural Disasters which are inherent to the geophysical conditions of the country. However, it is now well accepted that the effects of such disaster can be greatly reduced if the disasters are met with a prudent programme of action. Such programmes can be of different types but all must stipulate greater use of the advanced level of science and technology inputs compa-

tible to the country's situation. Here I want to bring to the notice of this august gathering the fact that the Nepalese Consultants have accumulated wealth of scientific knowledge as well as the required experience in dealing with natural hazards in the country and finding out the ways to confront the impending disaster optimally so as to mitigate the hazards. We have the necessary skills, we have the required experience and we are competent enough in the fields of planning, design and construction of infrastructures such as road, bridge, irrigation canals, buildings etc. This is very important and the government should be able to utilise the accumulated knowledge by involving the Nepalese consultants more and more so as to utilise their potentials effectively especially in the context of the relatively very high price of the services of the expatriate consultants. Many donor agencies have realised this fact. They make the participation of Nepalese Consultants mandatory in projects.

* Managing Director, SILT Consultants (P.) Ltd.

financed by them. At times they greatly rely upon and allow independence to the local firms in showing their excellence and at the same time giving them opportunity for self-development. Road Flood Rehabilitation project, which deals with the aftermath of one of the natural disasters i.e. floods/debris flow, may be cited as an example.

Another important aspect coming out of this is the fact that a greater utilization of the knowledge requires greater involvement of Nepalese Consulting and Contractor Industry in various policy formulation and programme implementation activities so as to ensure continual interaction between the concerned group of people. Similarly it is necessary to provide facilities and accord possibility to the consulting industry to participate in national or international fora, meetings, seminars and trainings.

We hope very much that the government as well as the National Committee on Natural

Disaster Reduction takes concrete steps towards this and gives us the possibility of offering our services more effectively in the proposed activities of the Decade. On behalf of the Nepalese Consultants I would like to assure the professional societies of our continual support to their efforts regarding natural disaster mitigation, control of environmental degradation etc. But I must here express my concern regarding the recent tendency of trying to solve the problems of environmental degradation in the cosy lobbies and halls of luxurious hotels rather than in the degraded fields, damaged riversides or deserted mountain slopes.

I thank the organizer of this workshop cum seminar for giving me an opportunity to express my feelings and I assure you of our continued support.

Thank you for your attention.



प्रमुख अतिथि प्रतिनिधि सभाका सभामुख श्री दमन नाथ ढुङ्गानाज्यूबाट सम्बोधन भाषण

नेपाल भौगोलिक समाजका अध्यक्षज्यू,
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अन्य प्राविधिक, प्रशासक मित्रहरू

संयुक्त राष्ट्र संघको घोषणा अनुसार अक्टोबरको दोस्रो बुधवार प्राकृतिक उत्पात न्यूनिकरण अन्तरराष्ट्रिय दिवस (International Day for Natural Disaster Reduction) हो । यही शिलशिलामा यो कार्यक्रम आयोजना गरिएको रहेछ । म प्राविधिक होइन । तपाईंहरूको आजको सेमिनार कम वर्कशपको जो विषय छ त्यसमा म त्यति बोल्न सकिन्न । कुनै किसिमको म बाट मद्दत हुन सक्दैन तैपनी आजको यो कार्यक्रममा प्रमुख अतिथिको रूपमा उदघाटन गर्नेको लागि संक्षेप बोलाउनु भएकामा म तपाईंहरूलाई धेरै धेरै धन्यवाद ज्ञापन गर्दछु । यस सेमिनार कम वर्कशपको अन्त्य सम्म बसेर केही बुझेर बोल्न पाएको भए मलाई सजिलो हुन्थ्यो होला । हुन त त्यस्तो बुझाई छतरनाक पनि हुन्छ । तैपनि छतरा नहुने गरी केही समझदारी बढाउन सक्छे होला तर अरु कार्यक्रममा पनि भागलिनु पर्ने भएकोले थुप्रै न जाँदैछु । मलाई लाग्छ यो सेमिनार कम वर्कशप धेरै उपयोगी होला । नेपालको सम्बन्धमा निश्कर्ष

निकास्ता र कार्यक्रम बनाउँदा सबै किसिमको सहयोग जुटला भन्ने आशा गरेको छु । जब देखि पृथ्वी वस्तु लायकको ठाउँ भयो त्यो बेला देखि नै प्रकृति र मनुष्यको सह अस्तित्व चलि आएको कुरा हो । वास्तवमा मनुष्य माथि प्रकृतिको कति निर्भरता छ भन्ने भन्न मुश्किल पर्छ किनभने प्रकृतिलाई मनुष्यले सुधार गरिदिन्छ तर त्यो सुधार प्रकृतिको आफ्नो आवश्यकता होइन जस्तो लाग्छ जति कि मनुष्यको लागि प्रकृति माथिको निर्भरता छ । त्यसकारण जब हामी भौगोलिक कुराहरूमा प्रवेश गर्दछौं पूर्ववक्ता प्राविधिकहरूले भन्नु भए जं सवेप्रथम हामीहरूले समस्या अर्थात् उत्पन्न हुन सक्ने संकट नै पहिचाननु आवश्यक छ । यस शिलशिलामा हामीहरू कारक तत्व (Root Cause) तर्फ जान्छौं । साधारण (Lay-man) दृष्टिकोणले म भन्दछु कि नेपाल नयाँ पर्वतीय क्षेत्रमा (Young Mountain Region) मा पर्दछ । भनिन्छ हिमालयको उचाइ बढ्दैछ साथै हिन्द महासागरमा बगेर गएको माटोले टापु बढ्दैछ । हामी भौगोलिक र टोपोग्राफिकल दृष्टिकोणले जुन स्थितिमा छौं त्यो खाली वैज्ञानिक र प्राविधिकहरूको मात्र सरोकारको विषय होइन । यो ऐतिहासिक परिवर्तन पछि हामीहरू

राष्ट्र पुनर्निर्माण गर्ने क्रममा छौं। यसको लागि पनि हामीले खास भौगोलिक समस्याहरू पहिल्याउनु पर्दछ। हामीलाई थाहा छ कि प्रकृति रथति छिटो बदलिदैँत तर यसलाई मानिसकालागि उपयोगी बनाउन सकिन्छ-जसको लागि मनुष्यकै सृजनशीलता आवश्यक हुन्छ। यसरी हेर्दा मलाई लाग्छ हामीले हाम्रो किसिमले ज्ञान हासिल नगरी मुर्ख छौं। जसका लागि नेपालका प्राविधिकहरू समर्थ हुनुहुन्छ र हामीले पाई पाएको अन्तर्राष्ट्रिय सहयोग पनि लिनु पर्छ। यदि हामीले त्यो ज्ञान हासिल नगर्ने र समस्याहरू पहिल्याउन नसक्ने हो भने हामीले धेरै उदाहरण देखिसकेका छौं। अब हामीकहाँ राजमार्गहरू, पुलहरू, बाँधहरू जस्ता कुनै पनि ठूला निर्माण कार्य पनि असम्भव हुने जस्तो हुन लागिरहेछ। किनभने हामीहरूसँग हाम्रो आन्तरिक श्रोत छैन। विदेशी राष्ट्र-हरूसँग बलबलल गुहारेर ल्यायो अलिअलि Public utilities बढायो तैपनि हाम्रो प्राकृतिक कारणबाट अलिक दिनमा लोप हुने, निष्कृष्य हुने, स्वस्त हुने भएर गयो भने हामीले साइराखेको धेरै मित्त राष्ट्रहरूको सहायतामा कालान्तरमा प्रष्ट चिन्ह लाग्न सक्छ। पहिलो कुरा हामी नेपाली प्राविधिकहरूले आफ्नो समस्या आफैँ निराकरण गर्न सक्नु परेको जस्तो छ। पहिले बुटवलको एउटा पुलको उदाहरण थियो भने अहिले सेती पुलको उदाहरण छ। कारण जे भए पनि यहाँकै वागमती पुलको पनि उदाहरण छ। यस्ता धेरै ठाउँमा खासगरी ठूला ठूला निर्माण आयोजनाहरूमा अब लगानी गर्नुभन्दा अगाडि सोच्नुपर्ने भैसकेको छ। यसकारण अहिले नेपाल पुनः निर्माणको चरणबाट गुज्रदैँ गएको खेलाना प्राविधिक प्रशासक र नीति निर्माताहरू र खासगरी राजनीतिक सहमा निर्देशनको आवश्यक हुन्छ, समन्वय हुनुपर्छ, विचारको आदान-प्रदान हुनुपर्छ। तपाईंहरूले राजनीति-

जहजलाई गाइड गर्ने पर्छ, Input दिनु पर्छ र Conclusion feed गर्नुपर्छ। राजनीतिज्ञहरू आफैँ ज्ञाता हुँदैनन्। खाली विभिन्न विकल्पहरूको बीचमा मात्र उनीहरूले छनोट गर्ने हो। यसकारण मलाई लाग्छ यसरी प्राविधिक, विशेषज्ञ र राजनीतिज्ञहरूको विचमा एउटा सालमेल बस्नेछ। समस्या खाली प्राविधिकहरूको हातमा मात्रै नछोडेर राजनीतिक नेताहरूले र नीति निर्माता-हरूले पनि right perspective मा यथोचित दृष्टिकोण दिनु हुनेछ। यो नै हाम्रो विकासको प्रारम्भिक बिन्दुको आधारशीला हो। यसमा लापरवाही गर्ने कुरै छैन। हामी जुन खेवमा छौं त्यो जुन Earthquake zone मा पर्दछ त्यो भौगोलिक वास्तविकता र जानकारी हासिल गरेर मात्र निर्माण सम्बन्धी आयोजनाहरूको लागि नीति निर्माण गर्न सक्छौं। यसमा यहाँहरूले जुन कार्य प्रारम्भ गर्नु भएको छ यो बढी उपयोगी हुनेछ भन्ने विश्वास गरेको छु। तर त्यसिले मात्र पुग्दैन होला। मलाई लाग्छ आजका तपाईंका निष्कर्षहरूद्वारा नीति निर्धारकहरूलाई विश्वास (Convince) दिलाउन, Persuasion गर्न र दबाव (Pressure) दबाव पनि दिन पर्ला किनभने राम्रो विचार (Idea) निक्लेर मात्र हुँदैन। राजनीतिज्ञहरूको टेबुलमा विबुध (Sell) पनि पर्दछ। यहाँहरूले स्वीकार (Accept) पनि गर्नु पर्दछ। यो काम तपाईंहरूले गराउनु हुनेछ भन्ने मलाई लागेको छ। यस्ता कार्यक्रमहरू बारम्बार आयोजना गराएर विशेषज्ञहरू बीच मात्र ज्ञान सीमित नगरेर जन चेतना (Public awareness) पनि बढाउनु परेको छ।

प्रकृतिभाषि मानिसको निर्भरता त छर्दैछ। उनी-हरूको बीच लडाईँ पनि भैरहेको छ। वातावरणको समस्या हेर्दाबिरी मनुष्य र प्रकृतिबीच सदा लडाईँ (Constant war) पनि भइरहेको छ। यस दृष्टि-

लाई हेर्दा प्रकृतिमाथि मनुष्य निर्भरताको चेतना बढाउनु परेको छ । प्रकृतिलाई आफ्नो वक्षमा ल्याउन र त्यसको चिर अस्तित्व मनुष्यकै हित र सामाजिक विकास सँग सम्बन्धित छ भन्ने चेतना ल्याउनको लागि खाली वातावरणको पक्षमा मात्र होइन प्रदुषण (Pollution) को पक्षमा मात्रै पनि होइन, भौगोलिक पक्षमा पनि जन चेतना (Public awareness) ल्याउनु पर्दछ जस्तो लाग्दछ ।

वातावरण र प्रदुषण सम्बन्धि प्रश्न पनि भौगोलिक सम्दर्भ (Geological context) भन्दा बाहिर देखिदैन । यी सबै घर्ती भित्रका कुरा हुन् । नागरिक चेतना बढाउनु पर्छ, तब जनमत निर्माण हुन्छ । जनमतको दबाव नपरोकन राजनीतिक तह पनि घब घच्चिदैन । प्रजातन्त्रमा यो अनिवार्य तत्व हो । जन समुदाय (Public level) मा, अप्राविधिकहरू (Non technical audience) मा पनि प्राविधिक विचार (Technical opinion) पुर्‍याएर तपाईंहरूले ज्ञागृति, चेतना र विशेष सूचनाहरू सर्वसाधारणमा

पुर्‍याउनु भयो भने र शक्ति केन्द्रिकरण (Force build up) गर्ने सक्नु भयो भने नीति निर्धारण गर्ने तहमा बस्नेहरूलाई पनि धेरै कदर गर्ने र कार्यान्वयन गर्ने तर्फ ध्यान बढ्न मद्दत मिल्ने छ ।

यो सेमिनार कम वर्कशपको सफलताको कामना गर्दछु र यसमा तपाईंहरूले जे विचार राख्नु हुनेछ त्यसको राजनीतिक तहमा उचित कदर हुनेछ र कार्यान्वयन तर्फ कदम बढाउनेछ । यस किसिमका गतिविधिहरू बारम्बार गरेर नेपालको जे आवश्यकता छ खासगरी भौगोलिक क्षेत्रमा नेपालले के गर्ने पथो ? खास समस्या के हो ? किन हामी खतराको बिन्दुमा बसीरहेका छौं यी बारे तपाईंहरूले भलाई लाग्छ चिरस्थायी प्रतिवेदन, कार्य योजना (Action plan), Chartor, बनाउनु हुनेछ । यस दिसा तर्फ तपाईंले प्रसन्न काम शुरू गर्नु भएको छ त्यसको लागि शुभकामना व्यक्त गर्दै तपाईंहरू सँग विदा हुन्छु ।

धन्यवाद



Vote of Thanks by T. P. Adhikary Secretary NGS

On behalf of Nepal Geological Society I would like to express my deep gratitude to our Chief Guest Right Honourable Mr. Daman Nath Dhungana, Speaker of the House of Representatives for sparing his valuable time to inaugurate the seminar cum workshop on "Geologic Hazards, Environment and Man-Made Structures" on the occasion of International Decade for Natural Disaster Reduction Day and for addressing the inaugural session.

I would also like to express my gratitude to our distinguished guests, Honorable Members of the Parliament, high officials of His Majesty's Government, Journalists and other distinguished personalities for offering their valuable time to attend this seminar cum workshop.

I express my gratitude to Member Secretary of Social services National co-ordination council for providing this beautiful hall to organise the seminar.

It is a pleasure for me to express that the Engineering Consulting firms like EAST consult (P.) Ltd., GEOCE Consultants (P.) Ltd., ITECO Nepal (P.) Ltd., Multi Disciplinary Consultants (P.) Ltd., SILT Consultants (P.) Ltd. are constantly supporting our Professional activity. I take the opportunity to express my sincere thanks to them as well as Shuva Sinha Consult (P.) Ltd. for providing financial support and cooperation for the organisation of this seminar cum workshop.

I would also like to express my sincere thanks to NGS-IDNDR Council for taking initiative to organise the seminar.

In view of the International Decade for Natural Disaster Reduction Day this seminar cum workshop would have to be organised at short notice. Mr. Amod Mani Dixit, Mr. Madhav Raj Pandey, Dr. Megh Raj Dhital, Mr. Nirendra Dhoj Maskey, Mr. Surya Prasad Upadhyaya and Dr. Toran Sharma have prepared the papers related to IDNDR.

activities in Nepal as well as to the recent events concerning Pokhara bridge damage etc. I sincerely thank them for their untiring efforts to prepare the technical papers at short notice.

many other members of the Society for their active cooperation in the Organisation of the seminar. Lastly, I thank all the members of the Nepal Geological Society for their active participation in the seminar.

I also thank Mr. Jagadish Shrestha, Mr. Sardesh Raj Sharma, Dr. Toran Sharma and

Thank you !



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Abstracts of Technical Papers Presented in Seminar Cum Workshop

IDNDR in Nepal: Problems, Scope and Activities

*A. M. Dikshit **

Natural hazards which are widespread in Nepal which cause loss of human lives and damage to properties and which adversely affect our development efforts are closely related with the specifics of the Himalayas. Main of the hazards are: Earthquake, Landslide, Erosion, GLOF/Debris Flow, Drought and their different combinations. The other forms of natural hazards, addressed by IDNDR, are less widespread in Nepal.

This hazard scenario of the country demands greater attention from geologists, hydrologists, meteorologists and civil engineers in carrying out scientific and engineering studies of the processes: source, location, size, severity, recurrent interval, ground and structural response etc.

Another problem to be addressed by the

professionals and the professional societies is that of translating the results of the studies into formats which are easily understandable by the non-technical users and to bring this information to those who use it. It is also required to help in identifying the appropriate hazard reduction techniques. Lastly the efficiency of the hazard reduction technique is to be reviewed and verified.

This entails formulation of appropriate comprehensive programmes for the reduction of each and every of the hazards by the joint efforts from government and academic and private agencies and individuals. It probably requires formation of task forces for the formulation of the program or helping the relevant agency to formulate the programmes and for their monitoring and reviewing.

Another important element of the IDNDR

* Director, SILT Consultants (P.) Ltd. Kathmandu.

concept is the fostering of effective scientific communication between various national agencies which in our context are the government agencies, University and various NGOS.

The professional societies should give high priority to public education to change society's attitude from fatalism to awareness of the opportunity for disaster mitigation and the role of individuals in protecting themselves.

Since existence of the Himalay is the most important factor influencing our environment, regional cooperation between the professional societies and individuals as well as program cooperation between various Himalayan countries is essential,

Active participation of Nepalese scientist and engineers in international projects, especially envisaged for the Decade, is necessary. The Government should facilitate such participation of individual scientists or professional societies,



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Seti Bridge Embankment Collapse

- N. D. Maskey*

The failure seems to be due to a combination of geological factors. Probable undercutting by the turbulent churning action of the river at the basal part of the gorge aided by the probable presence of more easily erodible material was the main cause of the failure.

The presence of an active N-S reported fault along the Seti Gorge together with the existence of pronounced intersections of N300°/85° NE and N200°/83° SE joint lineaments in the terrace conglomerate suggests creation of structural inhomogeneity aiding the collapse. The permeable and porous nature of the soil allows unhindered percolation of surface water. These dissolve limestone clasts and cementing carbonate material creating solution channelways resulting in creation of local inhomogeneity in the terrace rocks, making them weaker. To add to this, the unlined drainage channels on either side of the road debouched into the Seti crossing over weak zone of the failure site. During heavy rains the surface drainage infiltrated

through the weak zone, lubricating the discontinuity planes. Also the increase in pore water pressure in the conglomerate would have a derogatory effect and aid failure. Finally, the continuous and ever increasing heavy vehicular vibrations through time may have been instrumental in partly aiding the failure.

The settlement is complete. However, minor readjustment may give rise to slight temporary cavings and perhaps tilting as the river water will be active at the base. No immediate danger to nearby buildings is foreseen. However, surface drainage leading to the failure site must be lined and diverted.

A detailed geotechnical case study of the failure site should be undertaken in terms of canyon base and wall geology and regional framework, so that the outcome will be of help to predict stability criteria for other similar parts of Pokhara. It is strongly recommended that adequate geotechnical assessment be made as a ground work for the next bridge to be constructed.



* Senior Divisional Geologist, Dept. of Mines & Geology, Lainchour, Kathmandu.

Geodynamic Movement in Pokhara Valley- Seti Bridge Hazard

M. R. Pandey¹

R. P. Tandukar²

G. R. Chitrakar³

Geodynamic evolution of Pokhara Vally is occurring from coalescence of pull-apart basins and pressure ridges in the Quaternary period. Stress pattern giving rise to these structures alternates as well as rotates in time and space intermixing pressure ridges and pull-apart basins. Seti gorge and ground failures in other parts of Pokhara Vally can be interpreted satisfactorily from geodynamicity of this region,

Ramghat-Simalchaur area of the Pokhara

City where the Seti Bridge is located lies in the geodynamic stress transition zone. The area east of Seti along this corridor exhibits extensional structures while that west of Seti is characterised by compressive structures of different orientation and generation. The total effect of superposition of different stress systems in the transition zone can lead to tensile failures of the ground in this area.



The Intra-Montane Basins of The Midland Zone, Geological Hazards With Special Reference to Human Activities

Toran Sharma*

Intra-montane basins of the midland zone provide relatively plain landforms in the middle of the hilly rugged country. These landforms have been formed in the last several thousand years and are still on the formative processes. Their geological environment is very delicate. Even the minor changes in the

operative processes of the landform is of unrepairable consequences.

In the recent years, these landforms are under tremendous population pressure. Unplanned urbanisation and unmanaged land utilization has resulted into the degradation of the environmental balance. This paper

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highlights the geological hazards of the intra-montane basins. It also points out, on how the socio-economic activities are accelerating the geologic hazards ? A thorough

study, to this effect, is requested from all the concerned authorities of the country in order to preserve the environment of intra-montane basins.

Geological Hazards And Infrastructures

*- M. R. Dhital**

Construction of such infrastructures as dams, canals and roads in the Himalayan region requires a sound knowledge of geology. The active mass movement processes pose a serious threat to the infrastructures. In the Himalaya, such mass movement processes, as rock fall, rock and soil slide, debris and mud flow, landslide dams, glacier lake outburst

floods, and river underscoring are the common ones. Many examples of road washout, bridge failure and other disasters indicate the necessity of hazard and risk assessment and mapping. The environmentally sound design and construction of infrastructure is possible only by engineering geological and geophysical study of the area.

Best Wishes and Hearty Felicitations on the auspicious occasion of 42nd National Democracy Day

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सेमिनार / गोष्ठी सम्बन्धमा दैनिक तथा साप्ताहिक अखबारहरू

यही असोज २१ गते तदनुसार ७ अक्टोबर, १९६१ मा नेपाल भौगमिक समाजले आयोजना गरेको "भौगमिक उत्पात्, वातावरण तथा मानव निमित्त संरचनाहरू" विषयक सेमिनार कम वर्कशप सम्बन्धमा नेपालका प्रमुख दैनिक तथा साप्ताहिक अखबारहरूले दिएको समाचार पाठहरू समक्ष राखेका छौं ।

गोरखापत्र दैनिक मिति २०४८ असोज २२ गते मंगलबार

कार्यशाला गोष्ठी उद्घाटन

काठमाडौं, असोज २१ गते । प्रतिनिधि सभाका सभामुख दमनताप ढुंगानाले "भौगमिक उत्पात्, पर्यावरण तथा मानव निमित्त संरचनाहरू" विषयक एक दिने कार्यशाला गोष्ठीको आज यहाँ उद्घाटन गर्दै प्रकृति र मानव बीच परापूर्व काल देखि नै एकता र संघर्षको सम्बन्ध रहि आएको कुरा बताउनु भयो ।

उहाँले प्राकृतिक उत्पात्का साथै प्रकृतिमाथि मानवीय क्रियाकलापद्वारा सिर्जिएका उत्पात्हरू न्यूनिकरण कसरी गर्ने सकिन्छ भन्ने सम्बन्धमा ठोस निष्कर्ष निकाल्न पनि आग्रह गर्नु भयो ।

"अन्तराष्ट्रिय प्राकृतिक उत्पात् न्यूनिकरण दशक" दीवसको उपलक्ष्यमा नेपाल भौगमिक समाजद्वारा आयोजित सो गोष्ठीको सभापतित्व खानी तथा भूगर्भ विभागका

सहानिर्देशक श्री जम्भु प्रसाद सिंहले गर्नु भएको थियो ।

गोष्ठीमा सांसदहरू, अन्तराष्ट्रिय नियोगका प्रतिनिधिहरू, यु. एस. ए. धाइ. डी, इतिमोडका साथै विभिन्न परामर्शदातृ संस्थाका प्रतिनिधिहरू, नेपाली भूगर्भविद्हरू, खानी इन्जिनियरहरू र सिभिल इन्जिनियरहरूको सहभागिता थियो ।

गोष्ठीमा नेपाली भूगर्भविद्हरूद्वारा प्रायुष्यका साथै नेपालका विभिन्न क्षेत्रका खोलाहरू तथा तिनको प्रवाह एवं तिनमा निर्माण गर्ने संरचनाहरूको बनावट, पोखराको सेती पुलको क्षति र पहाडी भागका उपत्यकाहरूमा देखा परेका भौगमिक उत्पात् जस्ता विषयमा कार्यपत्रहरू प्रस्तुत गर्नुका साथै छलफल गरिएको थियो ।

रासस

साप्ताहिक विमर्श २०४८ असोज २५ गते शुक्रवार

प्राविधिज्ञले अब धर्ना दिनुपर्छ

मुलुकले प्राकृतिक उत्पातका कारण प्रति वर्ष ६० करोड भन्दाबढीको धन र जन जीवनको नोक्सानी बेहोर्नु परिरहेछ । यस्ता विपत्तिको पूर्वानुमान र जोखिम निर्धारण गरी नियन्त्रण गर्न नेपाली प्राविधिक क्षेत्र सशक्त भैसकेपनि सरकारले अहिलेसम्म त्यसको उपयोग गरेको छैन ।

उक्त कुरा नेपाल भौगमिक समाजले गत सोमबार आयोजना गरेको "भौगमिक उत्पात, पर्यावरण तथा मानव निर्मित संरचना" विषयक एक दिने कार्यशाला गोष्ठीका सहभागी भूगर्भ विद्हरूले व्यक्त गरेका छन् ।

राष्ट्रिय र अन्तरराष्ट्रिय स्तरमा २४१ प्राविधिज्ञहरू सहभागी भएको उक्त कार्यशाला गोष्ठीको उद्घाटन गर्दै प्रतिनिधि सभाका सभामुख दमननाथ ढुंगानाले "प्रकृति-माथि मानवीय कृषाकलापद्वारा सिजिएका उत्पातलाई घटाउन आवश्यक छ, सम्बन्धित निकाय वा सरकार यस तर्फ चिन्तित देखिएन भने प्राविधिकहरूले सरकारको टेबुलमा धर्ना नै दिनु पर्छ" भन्नुभयो । प्राकृतिक उत्पात- "दैवी प्रकोप" भन्ने गरिएको गलत परिभाषाले यस्तो उत्पात नियन्त्रण गर्ने र क्षति कम गर्ने उपायहरूमाथि प्रतिवन्ध जस्तै लगाएको छ भन्दै सहभागी भूगर्भ विद्-हरूले पूर्वसूचनाका आधारमा जोखिम निर्धारण गरी यसलाई घटाउन सकिने वा हृदसम्म रोकथाम गर्न सकिने

हुँदा "दैवी प्रकोप" भन्ने शब्द प्रचलनमा नल्याउन आग्रह गरेका छन् ।

गोष्ठीमा छव निर्माण हुने बाटा-घाटा, पुल र ठूला-ठूला आयोजनामा भौगमिक स्थिति निर्धारण गर्ने प्राविधिकहरूको परामर्श आवश्यक हुनुपर्ने व्यवस्था गर्न आग्रह गर्दै अहिलेसम्म औपचारिक रूपमा मात्र त्यस्तो परामर्श लिने गरिएकोले क्षति बढ्दै गएको कुरा उल्लेख गरिएको थियो ।

कार्यक्रमा भूगर्भविद् ग्रामोदमणि दीक्षितले नेपालमा यताबिधौ देखि प्राकृतिक उत्पातले पुऱ्याएका क्षतिको विवरण दिँदा यथार्थमा हाल विद्यमान रेकर्ड भन्दा दशौं गुनाबढी उत्पातहरूको रेकर्ड काममा नभएको जानकारी गराउनु भयो । यर्का भूगर्भविद् नीरेन्द्र ध्वज मास्केले सेतीपूल भत्कनुको कारण बारे कार्पेपल प्रस्तुत गर्नु भएको थियो भने भूगर्भविद् माधवराज पाण्डे, रामलोचन प्रसाद तण्डुकार र जानिराजा चित्रकारले पोखराको सम्बन्धित अध्ययन गर्नुपर्ने बिचार व्यक्त गर्नुभयो । त्यस्तै यस-पी. उपाध्यायले नेपाल अधिराज्यका नदीनालाले पुऱ्याउन सक्ने क्षतिक्षतिमाको मुन्ने डरलाग्दो चित्र प्रस्तुत गर्नु भयो ।

गोष्ठीको उद्घाटन सभा चानी तथा भूगर्भ विभा-गका महानिर्देशक श्री शम्भु प्रसाद सिंहको सभापतित्वमा सम्पन्न भएको थियो ।

उच्चस्तरीय प्रशासन सुधार आयोगलाई नेपाल भौगर्भिक समाजको सुझाव

नेपाल भौगर्भिक समाजले उच्चस्तरीय प्रशासन सुधार आयोगलाई उक्त आयोगको अनुरोधमा निम्नलिखित सुझावहरू पठाएको हुँदा पाठकहरूको जानकारीको लागि यहाँ प्रस्तुत गरिएका छन् ।

१. हाल भइरहेको जियोलाजी समूहलाई विभिन्न उप-समूहहरूमा विभाजन गर्ने । उदाहरणको लागि (१) माइनिङ जियोलाजी उपसमूह (२) हाइड्रोजियोलाजी उपसमूह (३) इन्जिनियरिङ जियोलाजी उपसमूह इत्यादि । उपयुक्त सम्मेलन गरी उपसमूहहरू निर्धारण गर्ने र प्राविधिकहरूको पदोन्नति सोही अनुसार गराउने व्यवस्था गर्ने ।

२. भूगर्भ पेशामा संलग्न जियोलाजिष्टहरूको संख्याको अनुशासनात्मक पदोन्नतिको संभावना धेरै कम छ । उदाहरणको लागि माइनिङ समूहको कर्मचारीको पदोन्नति माइनिङ इन्जिनियरहरूको संख्या कम भएको कारणले छिटो हुने गरेको छ भने उत्तिक योग्यता तथा अनुभव हासिल भएका जियोलाजी समूहको कर्मचारीको पदोन्नति जगद्वे दिलाउने गरेको छ । अतः जियोलाजी समूहमा प्रथम तथा

द्वितीय श्रेणीका पदहरू पर्याप्त गरिनु पर्ने ।

३. अन्य मुलुकमा चलन भए झैं हामी कहाँ पनि हप्ताको पाँच कार्य दिन मात्र तोकिएको खण्डमा सरकारी खर्चमा केही कमी हुने र कर्मचारीहरूको कार्य क्षमतामा पनि वृद्धि हुने देखिन्छ ।

४. हालसालै सृजना गरिएको सहायक सचिव पदको कुनै औचित्य नदेखिएकोले उक्त पद खारेज गर्नु पर्ने ।

५. वातावरण सम्बन्धी अध्ययनमा जियोलाजिष्टहरूको ठूलो भूमिका रहेकोले वातावरण मन्त्रालय अन्तर्गत एउटा जियोलाजी शाखाको व्यवस्था भई जियोलाजिष्टहरूलाई संलग्न गराउनु पर्ने ।

६. खानी जन्म उद्योगमा खानी सम्बन्धी विशेषज्ञलाई नै दायित्व दिनु पर्ने ।

७. खनिज विकास तथा अन्य कार्यसँग सम्बन्धित भौगर्भिक अध्ययन तथा अनुसन्धान बजेटमा तलब र विकास कार्यको बजेटबीच समुत्पन्न हुनुपर्ने । अर्थात् हालको स्थितिमा तलबको तुलनामा विकास कार्यको बजेट जगद्वे न्यून देखिन्छ । फलतः विशेषज्ञहरूबाट प्रभावकारी सेवा प्राप्त गर्न सकिएको छैन ।

८. खानो उद्योगलाई प्रवर्द्धन गर्ने आवश्यक प्राविधिक सेवा सुलभ तुल्याउन, खानी राजस्व संकलनको प्रभावकारीतामा अरु वृद्धि गर्ने, प्राकृतिक उत्पातको पहिचान तथा नियन्त्रणका उपयुक्त उपायहरू पत्ता लगाई जियो टेक्निकल सेवाहरू प्रभावकारी ढंगबाट उपलब्ध गराउन विभिन्न विकास क्षेत्रहरूमा क्षेत्रीय कार्यालयहरू खोल्नु पर्ने ।

९. हरेक वर्ष बजारमाउ अध्ययन गरी कर्मचारीहरूको जीवन निर्वाह गर्ने पुगेपरी तलबको व्यवस्था गर्नु पर्ने ।

१०. पदोन्नतितर्फ हाल बिद्यमान सेवा प्रवेशको योग्यता भन्दा एक तह माथिको योग्यता गणना गरी पदोन्नति गर्ने व्यवस्था भएकोमा सो व्यवस्था खारेज गरी सेवा प्रवेशको योग्यता तथा अनुभवको आधारमा मात्र पदोन्नतिको व्यवस्था गर्नु आवश्यक छ । साथै सेवाकालीन तालीमवापत पदोन्नतिमा दिइने अंकको औचित्य नरहेकोले सो व्यवस्था खारेज गर्नु पर्ने देखिन्छ ।

११. पदोन्नतिमा दुर्गम सेवा तथा तस्मा बापत पाउने नम्बर रद्द गरी सो बापत आर्थिक सुविधा वृद्धि गरिनु पर्ने ।

१२. सेवा प्रवेश गरे देखि अनुभवका लागि दिइने अंक हालको व्यवस्था अनुसार लगातार १ वर्ष अस्थावी सेवा गरेकालाई मात्र दिइने गरेकोमा सेवामा निरन्तरता नभए पनि कार्य गरेको दिनहरूको कूल दिन गणना गरी सो अनुसार अंक दिनु पर्ने ।

१३. सेवा प्रवेश गरेपछि कुनै पनि व्यक्तिले १० वर्ष पछि अनिवार्य रूपले पदोन्नति पाउनु पर्ने ।

१४. प्राविधिकहरूको पनि विशिष्ट श्रेणीसम्मको पदको व्यवस्था हुनु पर्ने ।

१५. खुला प्रतियोगिताबाट पदोन्नति गराइने पदहरूको संख्यामा वृद्धि गरिनु पर्ने ।



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12. LM-249	David Scott Silverberg	Dept. of Geology, Boston University 675, Commonwealth Avenue Boston, Massachusetts 02143, USA

- | | | |
|------------|----------------|--|
| 13. LM-250 | Edmund Krauter | Geologisches Landesamt Rheinland-pfalz,
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LECTURE PROGRAMMES IN 1991

The Nepal Geological Society organised several lecture programmes by national and international earth scientists during 1991. The lectures were held in the auditorium of Department of Mines & Geology (1, 5), meeting hall of Petroleum Exploration Promotion Project (2, 4) & lecture hall of Department of Geology of Tri-Chandra Campus (3). Several members of the Society attended the lecture programmes and held fruitful discussions with the speakers. Following is the list of the conducted lecture programmes.

<i>Lecture No.</i>	<i>Date</i>	<i>Topic</i>	<i>Speaker</i>
1.	26th May	Kinematics of the Higher Himalayan crystallines	Dr. A. Pecher Ecole des Mines, Nancy, France
2.	7th June	A model for the generation of the Himalayan leucogranites	Prof. Dr. Patrick Le Fort Institute Dolomieu, Universite Joseph Fourier, Grenoble, France
3.	9th August	Stratigraphy and structure of Dang-Sallyan area in Nepal Lesser Himalaya	Dr. M. R. Dhital Central Department of Geology, Tribhuvan University, Kathmandu, Nepal
4.	6th October	Seismic Hazard along the Frontal Himalayan Belt	Prof. Dr. Robert S. Yeats, Oregon State University, Corvallis, OR 97331-5506, USA
5.	4th December	European Experiences in Engineering Geology and their applicability in Nepal	Prof. Dr. Edmund Krauter, University of Mainz Bonner- bergstrasse- 12 6500 Mainz, Germany

Participation in Seminar/Conference Workshop

The following members of NGS have participated in seminar/Conference/workshop in 1991,

Topic	Participants	Duration/Country
International Conference on small scale Mining	Karki K., Maharjan S. R.	Oct. 3-5, 91 India
Workshop on Building Construction Materials	Karki, K.	Nov. 4-8, 91 Greece
International workshop on Geothermal Energy,	Maskey, N. D.	Nov. 11-15, 91 Philippines
Workshop on Environmental Impact Assessment	Shrestha P. L., Shrestha V. B.	Dec. 2-12, 91 Nepal
Seminar on Environmental Management for Mining & Mineral Resources Development	Shrestha P. L.	Sept. 9-13, 91 Thailand
Seminar cum workshop on Geologic Hazards, Environment & Man-Made Structures	Dhital, M. R.; Diskhit, A. M.; Maskey, N. D.; Pandey, M. R.; Sharma, T.	October 7, 91 Nepal
Seventh Regional Conference on Geology, Mineral & Energy Resources (GEOSEA VII)	Bashyal, R. P.;	Nov. 5-8, 91 Thailand
Workshop on 'Role of Geology in the National Development'	Dhital, M. R.; Dikshit, A. M.; Dhungel, M. P.; Gautam, P.; Kafle, K. P.; Karmacharya, R.; Rao, G. K.; Shah, R. B.; Thapa, G. S.; Upreti, B. N.; Chitrakar, G. R.;	July 4-5, 91 Nepal

Workshop on Seismic Resistant Design of Buildings. Dikshit, A. M.; Gautam, P. Dec. 15-20, 91
Pandey M. R.

Consultant to ESCAP for publications of Geology & Mineral Resources of Nepal Sharma, Toran Dec. 17-31, 91
Thailand

Completion of Diploma, Training/Workshop Programmes

Nepal Geological Society extends its hearty congratulations to the following members who have completed their Diploma Courses and Training/workshop programmes in various countries and wishes them success in their professional career.

Topic	Participants	Duration/Country
Training/workshop on Prospecting, Exploration and Processing of Gold Deposits	Aryal, B. R.; Jnawali, B. M.; Joshi, P. R.	April 1-May 30, 91 Australia
Training Course for Least Developed Countries (LDCs) on "Exploration & Development of Industrial Mineral Deposits/Construction Materials"	Amatya, K.M.; Karki, K.; Karmacharya, S. L.; Kharel, B. D.; Maharjan, S. R.; Mahato, P. S.; Mandal, R.; Neupane, D; Pradhan, D. K.; Pradhananga, U. B.; Shrestha, P. L.; Tuladhar, G. B.;	April 29-May 10, 91 Nepal
Diploma in Geological Survey	Bajracharya, S. R.	Sept. 1, 90-July 31, 91 The Netherlands
Diploma in Engineering Geology	Koirala, K.	"
Diploma in Geomorphology	Mool, P. K.; Rajbhandari, K. K.	"
G. S. I. Training	Dhoubdel T. P.	Dec. 3, 90-Aug. 9, 91 India
Diploma in Geothermal Exploration	Kansakar, D. R.	Nov. 15, 90-Jul. 15, 91 Italy

Diploma in Petroleum Policy & Management	Kayastha, N. B.	Sept. 9–Nov. 1, 91 Norway
Diploma in Petroleum Operation & Management	Pradhan, U. M. S.	..
Training in Groundwater Hydrology and Modelling	Amatya, S. M. C.; Shrestha, Rama, Tuladhar R. M.	Sep. 9–Nov. 15, 91 U. S. A.
Diploma in Exploration, Exploitation and Management of Groundwater Resources	Jha, J.; Sharma, R. R.; Upreti, S. R.	Mar.–9 Jul. 31, 91 Israel
Training on Petroleum Industry Management	Karki, R. K.	July 2–Aug. 22 91 Canada
Training/Workshop on Industrial Rocks and Minerals	Jha, S. N.; Shrestha, P. L.	Nov. 4–Nov. 9, 91 Vietnam
Training in Structural Geology	Tamrakar, S. M.	Nov. 10, 91–Dec. 1, 91 India
International Training Course for Coal Technology	Sthapit N. R.	Aug. 26–Oct. 5, 91 Australia
Rock Mechanics Training	Tamrakar, J. M.	Dec. 90–Jan. 91 Malaysia
Seismic Refraction Training	Shrestha, P. M.	July–Aug. 91, Canada
Geotechnical Training	Kafle, K. N.	Jan. 92 USA

Best Wishes

The following members of NGS are undertaking the following courses of study/Research this fiscal year 1991/1992. The Society wishes them success in their respective field of study/research.

Name	Course	Country
Dongol, G. M. S.	Ph. D. in Geology	Australia
Koirala, K.	M. S. in Engineering Geology	The Netherlands
Mool, P. K.	M. S. in Geomorphology	The Netherlands
Nepal, K. M.	M. S. in Engineering Geology	India
Shrestha, R. M.	M. Sc. in Quaternary Geology	Belgium
Shrestha, S. D.	M. Sc. in Environmental Science	Japan
Vaidya, B. G.	Engineering Geology	Thailand

Congratulations

a) On Completion of Ph. D.

- To Mr. Rajendra Bahadur Shrestha for defending his Ph. D. dissertation on "Evaluation of Mineral Exploration Potential based on Multi-Element Analysis of stream Sediment and Mineral Deposit Modelling" in University of Hawaii at Manoa, Hawaii, USA on August, 1991.

b) On appointment by the elected democratic Government of Nepal.

- To Mr. Gopal Singh Thapa, on being

appointed the General Manager of Udayapur Cement Industries (P.) Ltd., Udayapur, Nepal, on September 9, 1991.

c) On appointment by the Board of Directors EAST Consult (P.) Ltd., Kathmandu.

- To Mr. Lokendra Raj K. C. on being appointed the first Managing Director of recently established EAST SOIL LAB at Basundhara, Ring Road, Kathmandu on Nov. 1, 1991.



Status of Groundwater Exploration by Geophysical Methods

- Naba Raj Shrestha*

Water is an essential commodity for drinking, industry and irrigation. For drinking and industry, regular supply of water is a must throughout the year. For irrigation, however, it is mostly needed during the cultivation seasons. In a developing and agricultural country like Nepal, adequate supply of water could play important role in the economy of the country.

In Nepal, quantity of surface water varies widely with seasons, it being maximum during monsoon. The timing and the distribution of monsoon rain is not always a regular phenomena. This has resulted time and again in too little or too much rainfall affecting the crops. Instead of relying on monsoon we have to look for other more reliable sources of water to fulfil our needs.

resource preserved in subsurface reservoirs which are recharged free of cost by rainwater, streams, rivers, etc. There are various advantages of using this groundwater resource over the surface water. Few of them are as follows: it can be used as much as and whenever needed, it is not seriously affected by short drought, it causes neither silting in land nor water logging, it needs considerably low maintenance cost, it has less chance of contamination, there is no need to construct long canals as it can be tapped where it is necessary etc. People are becoming increasingly aware of these advantages and consequently the use of this resource is increasing.

In Nepal, the use of groundwater for agriculture has yielded encouraging results in increasing the product which is necessary for the fast growing population. As a result HMG and many other organizations like World

Nature has provided us with a vast water

* Divisional Geophysicist, Groundwater Resources Development Project, Kathmandu

Bank, ADB, Japan International Cooperation Agency etc. have shown interest to exploit and to encourage the needy to use this resource. Many shallow and deep wells have been drilled so far and many are proposed to be drilled in different parts of the country for the exploitation of groundwater.

Keeping in view the high cost of drilling for its exploitation, it is advisable to identify potential areas by applying cheaper and faster but reliable scientific methods before launching drilling programme. Some of the geophysical methods could help the best in this regard. They are mainly the Electrical methods, Induced Polarization method, Magnetotelluric method, Electromagnetic method and seismic method. The choice of particular method depends upon the geology of the area and nature of the problem to be solved among other things.

In Nepal, vertical Electrical Sounding (VES) or "Electrical drilling" is widely used; Refraction Seismics is used occasionally. In VES method electrical current is injected into the ground by means of two metal electrodes driven into the ground. To investigate increasingly deeper geological layers the spacing between current electrodes are increased successively. The subsurface resistivity variations caused by geological or hydrogeological conditions affect the underground current

flow patterns and also alter electrical potential on the surface which is measured by a second pair of electrodes. These data, when interpreted correctly, gives the thicknesses and types of the lithological sections present at different depths. Such informations usually form the scientific basis for the delineation of promising areas and planning efficient drilling programme.

The vertical Electrical Sounding method of exploration is in use in Nepal since 1970 and has covered many areas listed below.

Groundwater Exploration in Kathmandu Valley

Groundwater exploration in Kathmandu Valley has been carried out by different national and international consulting firms. Geophysical method (VES) was used as a basic tool to investigate subsurface geological structures in the proposed areas prior to drilling operation. The area where the strata were either predominantly clay or predominantly sand and gravel were delineated. Bed rock contour map was also prepared using the VES data.

The Central Department of Geology, T. U. also has carried out VES surveys at various places of the valley in course of the fulfilment of their University curriculum.

Groundwater Exploration in Terai:

Groundwater Resource Development Project (GWRDP) has applied VES and Refraction

Seismic methods in Surkhet and Dang Valley for groundwater exploration. The VES method of survey was employed as a prime tool to obtain hydrogeological information of the project area in Siraha and Saptari districts. At many places drilling sites were selected on the basis of VES result.

Groundwater Exploration in other parts of the Country :

Department of Mines and Geology(DMG) carried out Geoelectrical surveys in Panchkhal to investigate the groundwater potential of the area. The VES surveys were also carried out in Ilam, Nepalgunj, Pokhara, Hetauda, Dharan etc. to obtain informations on subsurface geology.

Apart from these surface geophysical works, GWRDP, DMG and NISSAKU Co. Ltd. are carrying out borehole geophysical surveys namely Self-Potential and Electrical Resistivity Loggings as a routine work after drilling a hole to help locate the potential aquifer and gas bearing horizon and to determine their thicknesses.

The surveys carried out in Nepal and elsewhere have shown that geophysics is an effective tool to obtain the hydrogeological information of an area in a time and cost effective manner. The survey results usually

form valuable basic information to prepare and run drilling programmes for groundwater exploitation in a more efficient and economic way.

Instrumentation :

The GWRDP and the Electricity Authority both possess the resistivity meter and Seismic Refraction Units. The GWRDP, DMG and NISSAKU Co. Ltd. have a number of SP/Resistivity logging equipments. The DMG and the Central Department of Geology, T. U. each possesses resistivity meters.

Manpower :

Qualified and experienced professionals are available in the country for efficient data aquisition, data analysis and their interpretation. The surveys carried out so far in a variety of geological settings has accumulated a reasonable amount of field data. These data could best be used for parametrical study or "Calibration" of resistivity data for different lithology which is essential for a reliable interpretation. The availability of other latest hardware and software has enhanced considerably the ability of geophysicists to face various related problems.

All these are the valuable resources which could be exploited for the maximum benefit of the country.

Usefulness of Remote Sensing Techniques in Environmental Protection of Nepal

- T. P. Adhikary*

Introduction

Environmental protection has become a matter of world wide concern. Human activities have led to global warming, depletion of ozone layer, destruction of forest crops, pollution of river water and atmosphere, ultimately damaging the human health. These phenomena have necessitated assessment of the extent of the environmental problems both globally and regionally in order to take adequate measures designed to protect the environment.

Environmental Concern

There is a great deal of difference in the environmental concern between the developed and the developing countries. The developed countries with their heavy industries, nuclear and chemical plants are contributing a lot to global environmental degradation whereas

developing countries with high population growth rate, growing urbanisation and introduction of industries are facing the environmental problems related to forest deterioration, soil erosion, pollution of river water, atmospheric pollution, desertification etc.

Nepal is concerned with both natural and man-caused environmental problems. These are forest degradation, soil erosion and landslides in mountainous terrain, whereas in urban areas the problems comprise river water pollution from sewerage and industrial wastes, atmospheric pollution from factories like cement, brick etc. and noise pollution and air pollution from vehicles

Role of Remote Sensing Techniques

Human desire to assess the earth's resources from time immemorial has now led to the development of air cameras, spacecrafts and

* Divisional Geologist, Dept. of Mines & Geology, Kathmandu.

sensors with advanced and improved capabilities. At present, remote sensing techniques, comprising both aerial photography as well as satellite imagery, are finding wider applications in agriculture, forest and water resources management, geologic survey and mineral/petroleum exploration, cartography, urban and regional planning, assessment of marine resources, oceanography, coastal engineering, disaster assessment and warning as well as in environmental problems assessment.

Even the first two LANDSATS (LANDSAT 1 & 2) possessed the capabilities to provide useful data for resource inventory and monitoring of environmental changes.

The LANDSAT 3 with additional thermal band (10.4-12.6 μm) possessed facilities to identify sharply the temperature related or emissivity related environmental problems such as water pollution, oil spills and thermal pollution. Areas undergoing desertification could also be monitored with the frequency of coverage once in 18 days.

The development of second generation satellites in mid-eighties opened a wide vista in acquiring resources and environmental information. One of these was LANDSAT 4 with advanced multi spectral scanner known as Thematic Mapper which has better monitoring capabilities for

environmental problems related to soil erosion, forest deterioration etc. Oil spills are better detected and monitored with imaging radar.

Utilization of Remote Sensing Data in Nepal

The first aerial photographs covering Nepal were taken in the beginning of fifties for the preparation of topographic maps of 1"-1 mile scale by Geological Survey of India. Aerial photographs of larger scale taken there after were used mainly by the Department of Forest to assess the forest resources of the country. The aerial photographs were later used by other government agencies like Department of Mines & Geology, Department of Survey, Soil and Water Conservation Department etc.

Nepal made an entry into the utilization of satellite data in the beginning of eighties with the preparation of land use maps based on LANDSAT data. Interest in examining and evaluating satellite images is on the gradual increase in government and private agencies. They are department of Mines & geology under the Ministry of Industry; Forest and statistics Division under the Ministry of Forestry and Environment; Integrated Survey Division, Department of survey; Ministry of Land reforms; ICIMOD etc.

There are already some trained personnel in Nepal to interpret and utilize

satellite imagery data for the preparation of generalised maps from which useful information about the land, agriculture, forest, water resources and geology can be derived. However, there is dearth of trained personnel, who are capable to use Landsat Multispectral data in digital form through computer analysis and manipulation of data. The Landsat scenes in digital form can be used faster and cheaper in monitoring and quantifying both natural and man-caused changes in the environment than manual extraction of the same information.

Nation's Task for Environmental Protection

It is high time for Nepal also to act immediately for environmental protection, be the problems man-made or natural.

In view of recent establishment of Ministry of Environment in association with Forestry in Nepal, constructive program for study of environmental problems should be designed and initiated. It requires bringing together several resource scientists like agriculturists,

foresters, geographers, geologists, hydrologists, soil scientists, zoologists, botanists etc. who need to work interactively with specialists in computer programming. The Ministry in its new capacity should acquire a co-ordinating role in the use of remote-sensing technology for achievement of its objectives of environmental protection. More persons should be trained in both qualitative and quantitative analysis of Multispectral and Thematic Mapper data and more hardwares and softwares should be procured. Above all, effective measures to minimise the distraction of the scientists and the engineers from their respective jobs should be taken.

Conclusion

Environmental protection is not successful without through understanding of the problems. In view of the wide scope of remote sensing technology in environmental data collection, an initiative should be taken toward an effective utilization of this important tool in Nepal.



Best Wishes and Hearty Felicitations

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Exploitation of Kharidhunga Talc

- R. Mandal*

Introduction

Talc is a hydrous magnesium silicate, theoretically $Mg_3 Si_4 O_{10} (OH)_2$. It is characterised by a "Softness" of 1 on Mohs hardness scale, a greasy feel and pearly lustre. Talc is found at different places in Nepal. A few of them are being exploited and most of them suffers from very poor accessibility, high cost of transportation and smaller size of deposit. Kharidhunga talc deposit is the largest known deposit of the country. It is located in Dolkha district of Janakpur Zone; is accessible by all weather road of about 112 km from Kathmandu. Nepal Orind Magnesite (P.) Ltd. started the development of the Talc mine along with Magnesite mine since 1980. It has a grinding unit of 10,000 tonnes/year capacity at Lamosangu, Sindhupalchowk district about 80 km from Kathmandu.

Uses

Starting shortly after birth, most of us

have an intimate relationship with talc. However, talcum powder is just one of many products that utilises the properties of talc. It has high oil absorption, a high fusion point, low shrinkage when fired and low electrical and thermal conductivity. Talc is used extensively in paint, plastics, paper, textile, rubber, soap, pharmaceuticals, ceramic, insulators, tiles, refractories, cosmetics, addition in animal foodstuffs, polishes, insecticides and pesticides.

Geology

Talc is an alteration product of original or secondary magnesium minerals or rocks resulting from mild hydrothermal metamorphism. Kharidhunga talc is associated with dolomite and magnesite. It occurs above, within & below magnesite body. Within the magnesite, the talc occurs in the form of veinlets and pockets and below-in association with dolomite. Common forms of talc deposits are

* Mines Manager, Nepal Orind Magnesite (P.) Ltd., Kathmandu

lenticular or irregular pockets. Individual lenses, pockets or bodies of talc deposits have limited lateral and depth-wise persistence. They show frequent swelling, pinching, fraying out or merging with other lenses, veinlets or pockets within short distances.

Reserve & Grade

Due to irregular nature of the deposit, exact reserve estimation of the talc is very difficult. However, Nepal Bureau of Mines, now Department of Mines & Geology, estimated 3,00,000 tonnes of talc. In view of the soft nature of talc and taking into consideration of mining and processing losses, the author feels that recoverable talc shall be about 50% of the above estimated reserve.

The grade of the talc is good and its colour ranges from light green to very white. The brightness of the 300 mesh powder varies from 80% to 90% and it has a very wide range of applications. Talc is free from any harmful elements like lead, arsenic and asbestos. Iron content is within the acceptable limit.

Mining

Talc is mined manually and selectively by an open pit mining method with 5m bench height. The overburden is dozed by a Bull Dozer and Talc is being recovered from selective

veins and pockets manually. The talc thus recovered is chipped, broken to mill feed size and sorted into various grades depending upon the brightness of the talc. The wastes are lifted mechanically from the face by using Loader-Dumper combination and disposed at waste disposal point. Talc being soft in nature is loaded manually into Trucks/Tippers for its further transportation to Lamosangu grinding plant.

Grinding

The sorted and graded talc is fed to a 30 tonnes hopper which further feeds to Crusher and then to Raymond Mill; which grinds the talc to 300 mesh size. The ground talc is packed in 50 kg jute bags. During the process of grinding and also before the feed the representative samples are taken from time to time and are tested for its brightness as quality control measure. Four different grades viz. (i) ORINEP SONA, brightness - 88 to 90% (ii) ORINEP RUPA, brightness-85% (iii) ORINEP VIDYUT, brightness- 82% and (iv) ORINEP INDUSTRIAL, brightness-80% are produced and supplied in the market.

Marketing

Kharidhunga talc mine is only a major source of the talc in the country and can meet the entire present requirements. The total annual consumption of talc in Nepal is about 5000 tonne. M/s. Nepal Orind Magnesite (P) Ltd. is facing some problem to meet the full

requirement of the country at competitive price due to high cost of truck transport involved especially for Far-East and Far-West regions. The four grades of talc are supplied to different industries in the country as well as in India. The main consumers of Kharidhunga talc are soap and paper industries. Minor quantities are also consumed by paint industries.

Kharidhunga talc is mostly preferred in Kathmandu valley due to superior grade, ease in availability and low cost of transportation.

Conclusion

Kharidhunga talc mining venture altho-

ugh small as compared to that of other countries comprises biggest talc mining operation in Nepal and is capable of meeting country's full requirements for next 25 years at present consumption pattern. 1st Sona grade has ready market in India. Kharidhunga mine is supplying basic raw material to many industries in the country thus saving the foreign exchange and creating employment opportunity. Such small scale mining operation should be encouraged for other mineral commodities as well.



Best Wishes and Hearty Felicitations on the auspicious occasion of 42nd National Democracy Day

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A Note on Stone Quarries

— Kiran Karki*

Introduction

More than 100 small scale mines of construction materials (stones) are located in the Kathmandu Valley only. The main potential areas are Adeswor, Halchowk, Pharping Dallu, Matatirth, Panighat, Hatiban, Thankot, Gadavari Chapagaon, Lele etc. Some of these are running for several years. Initially, the Beauru of Mines was responsible to issue the licenses for production of the materials.

In 1976 District Panchayats (political and non-technical organisations) were given authority to issue the licenses and control the production of the materials. Soon after licenses were started to be issued in a very unsystematic and haphazard way. Since then, the quarries were functioning in an unscientific manner and hence the produ-

ction was also uncontrolled and haphazard.

Since May 1991, all responsibilities of issuing licenses and controlling mines/quarries came under the jurisdiction of Department of Mines & Geology. The Department is giving specific emphasis for systematic and scientific way of mining providing technical assistance. At the same time supervision of the mining system and control of the production are also conducted to minimize the degradation of the environment.

FOREST VERSUS QUARRY

In the case of stone deposits in forest area, the following points need to be considered seriously:

- Analysis of the type and density of the forest to be affected.
- Analysis of economic benefits from material production in comparison to the forest.

* Divisional Mining Engineer, Dept. of Mines & Geology, Kathmandu.

- Analysis of potential erosion, slide, siltation, degradation of surrounding environment.
- Possibility of rehabilitation/forestation after quarrying.
- Socio-economic aspect of the quarry.

Requirement for Mining License

The country (specially Kathmandu valley) needs huge amount of stones/boulders, gravels and sand for the increasing construction day by day. This demands for the application of exploitation methods in a systematic way, which of course requires through checking and planning before issuing licenses.

When submitting application for mining

lease of construction materials(stone/boulders, gravels, sand) the following details should be provided to the Department of Mines and Geology by the applicant for consideration of grant of lease, and the Department has the full right to accept or reject the details provided by the applicant:

- Geological, Environmental and Social aspects of the area with topographical survey.
- Mining (extracting) methods
- Transportation and overburden dumping system.
- Economical aspect of the quarry.

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NECESSITY OF RIVER BANK PROTECTION WORKS FOR HILL AREA DEVELOPMENT IN NEPAL*

S. B. Upadhyaya†

There is a very wide variation in the topographic, climatic, geologic and geomorphologic conditions in the country. This has led to a very complicated hydrologic and hydraulic characteristic of the 6000 number of Nepalese rivers and streams, which constitute a drainage density of 0.3 km/km^2 and which together contribute 165 km^3 out of the total yearly Gangetic run off of about 200 km^3 .

The Nepalese people from the mountainous parts of the country, with all their aspirations and quest for development, have to live up with the so far unpredictable and extreme behaviour of these rivers and streams. This behaviour is also greatly influenced by the phenomena of glacier lakes outburst floods, cloudburst and the resulting landsliding.

In the high mountains where the agricultural and other economic activity is limited the streams are confined and deeply entrenched. Hence, even though the young stage streams have very steep gradient, there does not seem to be a very high necessity of river bank protection and river training works. A

program for the reduction of GLOF hazard is however, necessary. But in the Middle Mountain physiographic region where the main rivers in their youthful stage with their tributaries in young stage, the meandering or braided rivers have a very complex erosional and aggradational characteristics. Damage to human settlements, hill infrastructure and hill agriculture is very high. This is the region where river training works is necessary on a priority basis. Experience has shown that comprehensive geo-physical and hydrological study is essential for an effective river training programme. Recent experimentation in 10 watersheds in two physiographic regions showed that over 10 km of spur embankments are necessary in the 10 watersheds demanding a total of about Rs. 350 million or Rs. 35 million per watershed. It is necessary to develop comprehensive master plan of scientific studies, monitoring and analysis for each of the watersheds in order to effectively protect the river banks and mitigate the erosional/aggradational hazard by providing appropriate river training works.

* Abstract of Technical paper presented in seminar cum workshop on Geologic Hazards, Environment & Man-Made Structures.

† Director, Multi Disciplinary Consultants (P.) Ltd.

International Calendar

1. Februaury 4-6, 1992 Minerals, Metals & the Environment (conference & Exhibition), London, UK. (The Institute of Mining & Metallurgy, 44, Portland Place, London WIN 4BR, UK)
2. Februaury 23-27, 1992 First South Asia Geological Congress- GEOSAS-1, Islamabad, Pakistan (Dr. Hilal A. Raza, Secretary General, c/o, Hydrocarbon Development Institute of Pakistan, 230 Nazimuddin Road, F- 7/4, Islamabad, Pakistan.)
3. June 1992 World Mining (15th congress), Seville, Spain (World Mining Congress, Al Usazdwskie 1-3, PL-00583, Warsaw, Poland)
4. August 2-14, 1992 ISPRS XVII Congress, Washington, D. C., USA (XVII ISPRS Congress Secretariat, P. O. Box 7147, Reston, VA. 22091, U. S. A.)
5. August 9-14, 1992 International Geographical Congress (27th), Washington, D. C., USA (Dr. Anthony de Souza, 27th IGU Congress Secretariat, 17th & M st. NW, Washington, DC 20036, USA).
6. August 24-28, 1992 Erosion and Sediment Transport Monitoring in River Basins (International Symposium), Oslo, Norway, (Dr. Jim Bogen, Symposium on Erosion and Sediment Transport Monitoring Programmes, Hydrology Department, Norwegian Water Resources and Energy Administration, P.O. Box 5091, Majorstua, N-0301 Oslo 3, Norway. Phone: 47 2 959595; Telefax: 472959000; Telex: 79397 NVEON)
7. August 24-September 3, 1992 International Geological Congress (29th), Kyoto, Japan. Dr. Tadasahi Sato, Chairman, Japanese National Committee on Geology, Inst. of Geoscience, The University of Tsukuba, Ibaraki 305, Japan.)

8. November 16-21, 1992 International Symposium on Snow and Glacier Hydrology, Kathmandu, Nepal. (Mr. A. P. Pokharel, DHM, P. O. Box 406, Kathmandu, Nepal.)
9. April 19-21, 1993 International Seminar on Hydrology with a special Colloquium on Environmental Problems and Water Resources of Himalayan Region, Kathmandu, Nepal. (Dr. R. M. Tuladhar, Vice President, Nepal Geological Society, P. O. Box 231, Kathmandu, Nepal)
10. June 28-July 2, 1993 24th IAH Congress on Hydrogeology of Hard Rocks, Oslo, Norway (Dr. Einar Bernsten, Norwegian National Committee for Hydrology- NHK, P. O. Box 5091, Majorstua, 0301 Oslo 3, Norway).



Publication of Indian Journal of Petroleum Geology

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